THE FARMERS' REGISTER.

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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ESTIMATES OF INCOME FROM FARMING IN VIRGINIA.

To the Editor of the Farmers' Register.

Sir,—I have for some time wished to send you the following communication, but a variety of circumstances have combined to prevent it. Having leisure to-day, I avail myself of the opportunity. I am induced to believe, that there are very few farmers or planters in the habit of keeping a correct account of the proceeds of their farms, viz: the various credits that ought to be given at the end of the year. The outgoings they are obliged to know, because their accounts must be regularly paid, but I believe the agriculturist frequently finds himself in arrears. This I know frequently happens, and it is generally ascribed to an unproductive farm, when it is owing entirely to neglect or extravagance. I have for a length of time entertained the opinion, that old farms in Virginia, partly exhausted, and not very judiciously managed, were paying from 10 to 12 per cent. and good farms properly cultivated, paying from 15 to 20. Some of the credits I shall give in this communication, may appear novel; but I trust, a moments reflection will convince the reader that they are correct, and ought to be allowed. The great mistake or difficulty in Virginia farming, is, that there are many unnecessary debts incurred; many slaves that are consumers, and of course render little or no service. Such expenditure requires a considerable demand on the products of the agriculturist, and is not always taken in account, or allowed to stand as a credit to the farm. If we are disposed to live beyond our income by wasting the profits of our labor, we are the sufferers, and it is certainly correct to credit the farm with all its products. This, however, will not be allowed by those who are looking forward for what they call *clear profits*. It is mortifying and extremely discouraging, to see our old farms in eastern Virginia, deserted—lands naturally the best in the world abandoned, and the inhabitants daily emigrating to the far west, in search of wealth or gain. I feel well assured, indeed, I do not hesitate to say, that nothing but a correct system of agriculture is required in eastern Virginia, to make us the happiest and most independent people upon earth. I am not extravagant, when I say a well managed *gullied* farm in Virginia, yields at this time, nearly as much profit to the owner, as the rich cotton farms of the south, (the high price of their staple to the contrary notwithstanding.) It would, at first view, seem strange, that I should advance such an opinion, but let us make the calculation. In doing this, I will attempt to give a plain statement of facts, and will not, in order to prove my assertion, refer the readers to active, energetic managers, but will refer them to my own management, on a worn farm, which has been in hard cultivation for the last sixty years. It is pretty generally known by my friends and neighbors, that I have but little taste for agricultural pursuits, and although I have a farm, and manage it in my own way, yet I am no manager; indeed, I lack energy and industry, and acknowledge with shame, that I have been through life, too fond of ease.

The farm I live on, contains 410 acres, and if brought in market, at this time, would probably sell for $3,000. Most of my slaves are hired annually, and I keep only seven employed in the field, which would make five effective hands; and as Virginia laborers, would sell for $3,500. Horses, oxen, stock, plantation utensils, &c. &c. I put down at $1,000, making a capital of $7,500; the interest of which, amounts to $450.

Let us now see how the credits of the above farm stands for one year. I have taken the year 1835, because the products of 1836 are not yet ascertained. Here, I will remark, that I have not taken any account of the number of consumers in my family, or the necessary expenses incurred on the farm. Two thirds of the slaves are consumers, but this is my loss; the farm must be credited with its products, viz:—the increase and every thing made, grown, or manufactured. The credits are,

192½	bbls. corn, at $5,	$962 50
175	bushels wheat, $1,	175 00
250	bushels oats, at 63 cents,	157 50
6225	lbs. tobacco,	510 25
8	thousand weight fodder, at $1,	80 00
	Straw, shucks and top-fodder,	60 00
	Flax and cotton,	30 00
15	bushels sweet potatoes,	15 00
15	do. Irish do.	15 00
	Cabbage, beets, parsnips, turnips, onions, asparagus, peas, and other garden vegetables,	60 00
16	lambs (dressed,)	30 00
16	lamb skins, at 25 cents,	4 00
4	muttons (dressed,) at $3,	12 00
4	mutton skins, at 50 cents,	2 00
2800	lbs. pork, at $7 50,	210 00
120	lbs. lard, at 13 cents,	15 60
8	pigs, at 50 cents,	4 00
500	lbs. beef, at 6 cents,	30 00
50	lbs. tallow, (beef and mutton,)	6 25
2	cow skins,	4 00
100	lbs. wool, at 50 cents,	50 00
	Apples, pears, cherries, grapes, and other orchard fruits,	40 00
600	water-melons, at 12½ cents,	75 00
100	musk-melons, at 10 cents,	10 00
5	cart loads pumpkins,	10 00
16	dippers, (gourds,)	2 00
12	brooms,	1 50
8	gallons honey, at $1,50,	12 50
6	lbs. beeswax, at 25 cents,	1 50
200	chickens, at 12½ cents,	25 00
18	turkeys, at 63 cents,	11 34
15	geese, at 37½ cents,	5 62
50	doz. eggs, at 20 cents,	10 00
15	lbs. feathers, at 34 cents,	5 00
	Spinning and weaving 200 yards cloth, cutting out and making up do.	50 00
	Making 18 pair coarse shoes, at 34 cents,	6 00

220 lbs. butter, at 25 cents,		55 00
400 gallons milk, at 25 cents,		100 00
ashes, hen-house, farm, pen and stable manure,		200 00
Birth of 3 slaves, at $100 each,		300 00
24 young hogs, for pork, in 1836, at $1,		24 00
9 young sheep, at $1 75,		14 00
3 calves, at $3,		9 00
Negroes' Credits.		
7½ bbls. corn, at $5,	$37 50	
Blade fodder, top fodder and shucks,	3 50	
150 head cabbage, at 6 cents,	9 00	
6 doz. cucumbers, at 25 cents,	1 50	
6 doz. symlins, at 25 cents,	1 50	
3 bushels potatoes, at $1,	3 00	
1 do. onions,	1 00	
100 melons, at 12½ cents,	12 50	
Red pepper, gouber peas, and grass nuts,	2 50	
Pumpkins and broom-corn,	2 50	
4 bushels walnuts,	2 00	
Trapping 3 doz. hares, at 12½ cents,	4 50	
6 white oak baskets,	3 00	
Making and mending shoes for neighbors slaves,	5 00	
2 bbls. percimmon beer, at 12½ cents per gallon,	9 00	
6 foot-mats, at 37½ cents,	2 25	—100 25
		$3,500 31

Some of the above credits are guessed at, and the prices also, but they are not far from a correct estimate. It may be said, that I have credited the farm with many articles necessary for its support: be it so—my object in making this communication, is to give a full and fair statement of every thing made, grown or manufactured, without taking into account the expenses incurred, and given to the public for what it is worth. It may, perhaps, rouse and stimulate those who cultivate poor farms to more active exertion; for I do contend, that industrious, enterprising agriculturalists on old farms in eastern Virginia, will do better for themselves, their families, and the community in general, by remaining at home and improving their lands, than they could possibly do by emigrating to the south-west, and incurring the expense of clearing the forest, opening and improving farms, planting orchards, building houses, and forming new acquaintances and friends. This, however, is seldom regarded, we have but few Virginians at this time that love *home;* they see a great opening before them, extending beyond Virginia to the Rocky Mountains, and they are anxious to be among the first to fill it up.

You, sir, have done much for the Old Dominion, and much remains for you to do. I feel disposed to call loudly on all the Agricultural Societies of Virginia, and the literary and enlightened part of the state, to give some assistance to your laborious undertaking. We are about forming a club of some 12 or 15 gentlemen, whose duty it shall be to furnish an agricultural communication for the "Farmers' Register" every month, or oftener, if we find it convenient; and, we hope, gentlemen from other counties will come to the same determination, and fill up the Register with useful agricultural matter. I wish that I was an industrious farmer, instead of a lazy M. D. I should take great pleasure in writing and sending on agricultural communications for the "Farmers' Register," but I have been too negligent in my profession and have ploughed the old farm up and down-hill so long, that its soil has followed the plough furrow, branches and creeks, until it has in all probability reached the Atlantic, leaving me in my 52nd year, to renovate the sub-soil, and instead of writing in my parlour for your periodical, have still to labor hard to make up for mis-spent time.

Give me leave to say, that the literary and agricultural departments of the "Farmers' Register," require some attention; there is still room for improvement. The editorial department, I think, very good—but the literary department particularly, does not blaze forth with such scintillations as might have been expected from such resources. I do not wish you to understand by this remark, that you have not done your duty ably and faithfully; but where is * * * * —and * * * * esquires—the Hon. * * * *—the Hon. * * *—Judges * * *—* * *—* * * and * * * M.D. and a hundred other literary gentlemen in Virginia? I wish to see the "Farmers' Register" travelling far beyond the agricultural limits of Virginia, and in order to do this, you must give it more sail and ballast. A gallant streamer bearing the horn of plenty, filled with the agricultural products of our highly favored land, should be seen waving on its mast, with you sir, a thirty-six pounder on its deck, to fire the grand salute. It is an excellent farming repository, containing many valuable agricultural disquisitions, and nothing is now required, but to enlist the services of the literary sons of the Old Dominion, in order to extend its influence, not only throughout the United States, but the whole civilized world, and "make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before." GALEN.

[The foregoing estimate of products we think much too high—but shall not offer corrections.

The initials which our correspondent had given above, of sundry distinguished literary gentlemen of Virginia, we have chosen to leave out, but will answer his inquiry with regard to them. The first mentioned, is a true friend and efficient aid to the Farmers' Register—often a contributor to its pages, (though less often than would be desirable,) but is to be generally condemned (like our present correspondent, Galen,) for using fictitious signatures, and thereby lessening the value of all communications of matters of fact, or of opinion resting on experience of other facts. One other, only, of the distinguished gentlemen designated above, is a subscriber to this journal, who has punctually paid his money for it, but has never furnished any other aid. As to the others—among them there is not one who subscribes for, writes for, or (so far as we know,) reads the Register, or cares whether it stands or falls. A very few of the distinguished men of Virginia have been contributors, and most valued contributors to this journal—but to not one who was deeply engaged in party politics, or holding political or judicial office, has this journal

been indebted for even one line—and scarcely for very little other than the pecuniary support furnished in the few subscriptions. We are very little indebted to either the agricultural knowledge or zeal, the literary attainments, or to the public spirit and patriotism of either our public or our *great* men: yet probably, there is not one among them, who, if asked his opinion, would not readily testify in favor of the value of this journal, to agriculture and the commonwealth, and the high importance of its being well sustained.

In reply to another remark—it is readily admitted that this journal has not, nor was it ever designed to have, any pretension to be a specimen of *belles lettres*. Fine writing is highly to be prized, as an attractive garb for solid and valuable matter. But the substance is of so much more importance to an agricultural journal, than the form, that the latter, however beautiful, if the principal merit, would be deemed by us as very worthless. Yet there are very many who can state valuable facts, and furnish excellent matter for instruction, who would be altogether deterred from the attempt, if their communications were to be estimated by the standard of literary merit.]

PLASTER OF PARIS ON MARLED LAND—GREEN SAND.

To the Editor of the Farmers' Register.

December 18, 1836.

When I commenced farming, some years ago, I began to use plaster of Paris and clover; but finding several beds of marl, which I soon worked to a considerable extent, I discontinued the use of plaster. This was done the more readily, because my experiments had not satisfied me of its efficacy; and I considered the marl, which rendered certain a moderate crop of clover on almost any land, a substitute for the plaster. Last spring, Mr. C. of S., riding with me over my fields, remarked that the clover was unusually well set, but that the crop was too light. This I ascribed to the coldness of the season, and the want of strength in the land; but when told that it had not been plastered, he attributed it to that cause, and strongly urged me to have it done immediately. Rather at his instance, than from any expectation of benefit from it, I ordered some ground plaster from Haxall's mills, and had fifteen or eighteen acres of clover, of one year's growth, sown with it at the rate of about three pecks to the acre—but I regarded the experiment with so little interest, that I did not visit the place again till after harvest, and then for the purpose of marking the spots where manure would be required before the land was fallowed for wheat. I soon came to a place where the clover was inferior to the rest of the crop, but to my surprise, I found it continued so through the whole length of the bed. Passing on further, I observed the same was the case with another bed, and then I recollected the plaster. Some six or eight beds which by my directions had been left out when the plaster was sown, were most conspicuously inferior to the rest. On them the clover was small and yellow, while that which had been plastered, was fresh and green, and vigorous, and seemed to have taken a second growth. The crop there, was more than twice as heavy as on the beds which had not been sown with plaster. I never saw an experiment that was more convincing. It is entitled to the more weight, because it was made by one who did not anticipate such an effect, and its result forced itself on his attention at a time when it was not directed to the experiment. The plaster was sown about the last of May. Its effect would probably have been much greater, had it been sown in April, and in a larger quantity to the acre. The difference in the crop of clover was such as to pay for the plaster five times over.

The land had been marled with 600 or 800 bushels to the acre, some years before.

It is late in the day to be attesting the virtue of plaster of Paris, but I communicate my experiment, because it was made in conjunction with marl; and on land, level, grey, and inclining to sandy, to which plaster has not been supposed to be favorably adapted. Incredulity is much more easily removed by our own personal observation, than by the reports of others; but if this shall induce any one similarly situated to make the same experiment, he will find it much to his advantage.

In the last number of the Register, you express some doubts concerning *green sand*. Professor Rogers found it in all my beds of marl, but much more abundant in some than in others. The marl in which it most abounds, has enriched the land to which I have applied it, far more than that which contains less of it—so that I have no doubt its superior efficacy is owing to its containing a greater portion of green sand.

In your "Essay on Calcareous Manures," you mention the advantageous use of plaster on marled land and my facts are another evidence of the correctness of your work—to which my experience furnishes no exception.

W.

[Our correspondent was mistaken as to the nature of our doubts regarding *green sand*. We entertain no question that it is a useful manure, in most, if not in all cases, *in conjunction with marl or lime*—but we doubt its usefulness on an acid soil, *without* calcareous matter—its permanency—its supposed superior value under any circumstances to calcareous manures—and we more than doubt its virtue being owing, as supposed by Professor Rogers, to the action of the potash contained in green sand.

The testimony from this source to the correctness of the important doctrine first maintained in the *Essay on Calcareous Manures*, of marling causing gypsum to be active as manure, on soils where it had no effect before marling, is a powerful support—and as gratifying to the author, as our correspondent's further testimony in favor of the correctness of all the other novel views there presented and maintained.]

RAIL ROAD ACROSS THE ISTHMUS OF PANAMA.

Col. Charles Biddle, a citizen of the U. States, in conjunction with a few capitalists in this country, have obtained a contract for a rail road across the Isthmus of Panama, which promises, if completed, to be of immense importance to our commerce, and to the whole world. It must become,

in a few years, the highway of nations to the Pacific Ocean, and will enable our whaling ships to make their return every six months, instead of three years, as well as save a dangerous voyage around Cape Horn.

From the Gardener's Magazine.

NOTES ON THE FOREST SCENERY IN NORTH AMERICA.

Made by Mr. James M' Nab of the Botanic Garden, Edinburgh, and Mr. R. Brown, late of Perth, during a journey taken for the express purpose of observing the characters of trees in their natural woods.

Every individual who has been accustomed, during his home travels, to pay any attention to the forest scenery in his native country, must be astonished at the great difference which a foreign land presents.

In tropical regions, the whole aspect of a country is changed by the total alteration in habit, and the luxuriancy of the forests, compared with those seen in temperate climates.

In North America, the forest scenery is sublime, and upon a very extensive scale. When looked upon by the inexperienced observer, it may not seem to afford forms different from what he has been accustomed to witness in other countries; but the practical eye must at once perceive the wonderful difference of form which the American trees present.

Before landing upon the shores at New York, the head-lands appear to the stranger from the old country, of a very dark and dismal hue, from the quantity of pines and red cedars *(Juniperus Virginiana)* which seem to be the chief inhabitants of the soils around: but on landing, the whole city and neighborhood seems like a vast garden, from the number of beautiful trees, which either grow spontaneously, or have been introduced into the avenues of the city, from more southern climes.

It is here, that the observing stranger is first impressed with the great diversity of form, and the variety of foliage furnished by American trees: but it is not to be expected that, throughout the country, this diversity of form is every where to be seen. It is much the contrary. Near the large cities none of the natural forests remain, nor can they be expected, till we penetrate beyond the reach of internal communication of rivers and lakes: for the demand of wood, as fuel and otherwise, in the neighborhood of such places is very great.

About Hoboken, in New Jersey, many very ornamental forest trees of great size are seen, and frequently covered to the summit with wild vines. Of these the *Plantalis occidentalis* (button-wood or false sycamore,) *Liriodendron tulipifera*, (white wood or tulip tree,) *Liquidamber styraciflua*, (sweet gum,) with some splendid oaks, chestnuts, limes, and honey locusts, *(Gleditschia triacanthos,)* are pre-eminent. There are also many magnificent Catalpa trees *(Catalpa syringifolia,)* with a great number of fine old weeping willows and Lombardy poplars. These last appear to be universal favorites, for they are every where to be seen, and are indeed almost the only exotic forest trees which the Americans think of planting. The Lombardy poplars, from their great abundance, give to a place a very curious, but by no means a picturesque appearance.

All over the northern parts of New Jersey, the soil is good, and the vegetation very various. In the southern parts, however, the soils are poor, and covered chiefly with pines, red cedars, and scrub oaks. The swampy grounds abound with white cedars, *(Cupressus thyoides,)* and around the borders of the swamps, the *Magnolia glauca*, *Kalmia latifolia*, *Rhododendron maximum*, with many other varieties of Azalea viscosa, Andromedas, &c. are seen in great abundance.

Proceeding from New York by steam boat up the Hudson river, towards Albany, the scenery is romantic and varied, both from the irregularity of surface, and from the ornamental nature of the trees, which in many parts grace its banks. Leaving the city upon our right, we dash along as if on the surface of a lake, no outlet being seen, from the innumerable twists and turns which the river takes. The banks, for many miles up, are covered with brushwood, the larger trees having been mostly cut down. On the left, which is the New Jersey side, the land for many miles is very bold, having shelving rocks, towering three hundred feet above the river, and clothed with red cedars.

At *Tappan Sea*, twenty-five miles up, the river attains considerable breadth. On the right, the land is laid out in fields for the cultivation of grain. Many apple and pear orchards are mingled with these fields, and produce a curious effect from the trees being placed at regular distances, and having large tufted round tops.

Passing *West Point*, fifty miles from New York, the scenery assumes quite a Highland appearance: the hills are seen elevated high above the waters, and their round summits densely studded with cedars; two miles further up, the scenery is changed from a highland to that of a lowland description; and many cultivated farms are again seen extending back into the country on both sides. On the most worthless spots by the river side, for the last forty miles, red cedars were predominent; and where soil existed in any quantity, oaks were interspersed.

About *Hampton*, sixty-seven miles up, we got into a great limestone country, and the change from the dark hue of the red cedar, to the fine lively green of the Arborvitæ, *(Thuja occidentalis.)* is at once the most striking. These trees are self-sown over the surface of the rocks and along the water edge; in general, they are finely shaped pyramidal specimens, varying from one to twenty feet in height.

At Poughkeepsie, still further up on the right, a difference begins to show itself, the ground, being now ornamented with a few exotic trees, or mixed with indigenous ones, are seen the Huntingdon and weeping willows, with Lombardy poplars; all much planted by the proprietors, both by the water's edge, and interspersed amongst the native woods.

Passing *Hyde Park* to *Rhinbach*, the same spirit for planting a few ornamental trees, seems to have prevailed: and among them were catalpas, which at this season of the year (July,) presented an interesting appearance, from the quantity of flowers which they displayed.

Here for the first time, the Catskill Mountains are seen towering high upon the left at a great

distance. They are evidently wooded to the summit. Continuing onwards, on both sides, many beautiful residences are passed; and the cultivated land extends, with well defined edges, to the river, till within a mile of Albany, where the river gets much broken with islands, and the banks become low, but not destitute of that shade, which is so characteristic of American scenery.

Between Albany and Lake Champlain, the ground in general is in an excellent state of cultivation; and being well watered, is rendered, in consequence, an agreeable situation for the settler. There it was that we first caught a sight of the *Abies Canadensis*, (hemlock spruce,) and the lofty white-bark American elms, in native stations.

Entering another steam boat upon *Lake Champlain*, from the westward, the course is winding and narrowed. The woods on both sides, for the first sixteen miles, are various, the principal trees being the wild cherry, (Prunus virginica,) elms, walnut, sugar maples, with the aspen poplar, *(Populus tremuloides.)* The rocky grounds again abound in arborvitæ. After having fairly entered upon the expanse of the lake, the appearance of the lofty white or Weymouth pine, *(Pinus strobus,)* towering above the deciduous trees, on rising grounds at the base of the hills, of a dark aspect, nearly destitute of branches was remarkable.

About *Essex*, half way along, the lake widens much, and all at once the wooded rocky land by the water's edge, is changed for a rich fertile country. The different farms having their fields laid off in squares, and a large orchard attached to each, render this tract, with its natural beauties very agreeable. The soil around seemed a light rosy-colored clay, and the wood on the lower grounds was not very plentiful, but the rising grounds behind were densely studded with scraggy pines.

On reaching St. John's, the northern extremity of Lake Champlain, the forests presented the same appearance as they did where we first entered upon the Lake, with the addition of the *Abies balsamea*, (or balm of Gilead fir,) and the sugar maple, which is here in greater quantities, and larger than we had hitherto seen. Notwithstanding the great mutilation which the trees are subjected to in early spring, for their juices in the manufacture of sugar, they appear all in the most perfect state of health.

Passing onwards to *Lapraire*, on the St. Lawrence river, the only tree observed of any interest, and deserving of notice, was the Canoe birch *(Betula papyracea.)*

Several dense masses of these trees occupied the lower ground: but from their closeness, none had attained a great size. Till reaching this point, birches were by no means plentiful.

From the Southern Agriculturist.

ON GRASSES FOR SOUTH CAROLINA.

Columbia, S. C., Oct. 28, 1836.

Dear Sir,—Having been long deeply sensible of the importance of a successful cultivation of the grasses in our state, I have applied my attention to that subject, with some considerable assiduity and care, for several years past; and am sorry to say, I have not as yet met with that encouragement I had very earnestly hoped for, and had anticipated. Nevertheless, I am not so much discouraged as to deter me from further trials; nor do I, in the least, despair of ultimate and complete success, if the experiments should be persevered in, with an assiduity and a sound discriminating judgment, commensurate, in any moderate degree, with the vast importance of the object. Every planter and farmer is fully sensible of the prodigious disadvantages under which he labors, from the want of rich and abundant pasturage and forage grasses. He cultivates richly remunerating staple productions, and receives very handsome annual incomes of money; but, from the steril face of the country, as regards the grasses and forage, he finds his income unavoidably and deeply encroached upon and drained, by the annual purchase of mules, horses, pork, and beef. In fact, he finds his seemingly lucrative employment rather a tantalizing fiction than a substantial reality. Indeed, it has been asserted, by some of the profoundest writers on agriculture, and I am inclined to believe, with much truth, "that no country was ever known to be really and permanently flourishing, that was destitute of rich and succulent grasses."

That South Carolina is incapable of producing a rich supply of the grasses, it would be absurd to suppose. I remember the time myself, when almost the whole surface of the soil, especially in the upper country, was a rich natural meadow, of the most succulent and nutritious herbage and grasses: and a soil so fertile as her's is, in the production of other valuable articles, it would be preposterous to conclude, is steril in the grasses. The truth is, we forget that every climate and soil has its own peculiar adaptations to certain vegetable productions; and not less so to certain species of grasses than to any thing else. That our climate is too hot and arid for the grasses, is a mere chimerical assumption. We know that the richest pasture lands in the world are found between the tropics; and the species of grasses which luxuriate there, would at once dwindle and fail in a high northern latitude, as certainly as the northern kind do at the south. Our error, heretofore, has manifestly lain in seeking our grass seeds in climates entirely too cold. We have persisted in endeavoring to force the culture of the northern grasses in our southern climate, instead of seeking them amongst the indigenous and succulent kinds in our own soil, and elsewhere still further south. It would be absurd to attempt to force the culture of clover and blue grass in the island of Jamaica; but the Guinea-grass, first introduced by accident from Africa, luxuriates there in a most extraordinary manner, and has proved to be a mine of wealth to that people. In like manner, we have no reason to despair, that with a proper spirit of enterprise and perseverance, we may yet succeed in finding some species of the grasses, that may flourish and revel in Carolina, equal to the clover and timothy of the northern states, or the Guinea-grass of Jamaica.

And although it is to be feared that many species of the native grasses best adapted to our soil, have become extinct by our negligence, yet perhaps it is not the case with all of them. And, by diligent observation, perchance, a solitary, vigorous, and succulent tussock may be found in some unfrequented nook, or perhaps in more exposed

situations, which, upon trial, may prove equal to our most sanguine wishes. Witness, the Gama-grass, which is a native in almost every part of the state, and which gives a more flattering promise than any other that has ever been tried; yet this grass had never commanded the slightest attention until very recently. There may be other kinds, still superior to this, which we are treading under foot every day without notice; and which, if brought in cultivation, might cause our land to teem with animal life, and diffuse an aggregate of prosperity, wealth and human enjoyment, of which, at present, we hardly have a conception. But if there are none such here, let us not despair: let every one exert himself to introduce seeds from elsewhere. The innumerable species of grass and forage plants growing upon our luxuriant prairies of the south and west, are all, as yet, untried. And South America, for aught we know, may be producing grasses, that, if introduced here, might clothe our fields spontaneously with an inexhaustible abundance of the richest pasturage and forage. But to accomplish this desirable object, requires the united exertions of every citizen. There must be a widely diffused anxiety for effecting the object, and a pervading spirit of emulation every where, before we ought to look for success in the pursuit. A single individual, it is true, might perchance hit at once upon the very grass best adapted to our climate and soil, but it would be more an accident than any thing else; but if thousands were engaged in similar experiments at the same time, they could hardly long fail of success. In hopes therefore, of giving some stimulus to the laudable undertaking, I have been induced to offer you this brief communication; and although I have not much else than an account of failures to present to you, yet I conceive even these are not without their utility. They may serve to prevent others from repeating the same experiments, and thereby save them from disappointments and loss of time, whilst they may at once direct their attention, and make their attempts, in some other untried direction. Let no one be deterred from the undertaking, from a fear of the expense, or a loss of labor that it may require. One peck of seed is sufficiently ample for the experiment, and the labor bestowed in sowing a peck of seed is, comparatively, nothing. Experiments upon the small scale are every way to be recommended: they cost but little, and are quite sufficient for showing the result of the inquiry in hand. A careful observer may perceive, almost at a glance, after his plant gets into growth, whether it is congenially located, or not. If its adaptations are complete, it will at once throw out unequivocal evidence of the fact. It will, for the most part, exhibit vigorous habits, and will not droop or fade for slight and trifling causes. On the contrary, a plant uncongenially located, will early exhibit a delicate appearance, and will languish and droop from causes slightly adverse to it: and a peck of seed, with due attention, is quite as sufficient for ascertaining the adaptation of the plant to its soil, as many bushels would be.

I have made two trials to cultivate the red clover. One of them was made in 1816, on rich river land in Richland district. It was sowed in February, without oats, and, at the same time, was applied one bushel of gypsum to the acre. It came up well, and flourished until the oats were cut off; but there came a drought in July and August, in which it nearly all perished. I again tried it in 1832, with orchard grass, on fresh and somewhat clayey and fertile highland, in Fairfield district; and, although I applied manure somewhat liberally, and a bushel of gypsum to the acre, it did not flourish so as to make it an object to cultivate it, either for forage or as a green manure. Clover, I think, requires carbonate of lime, as well as gypsum, in the soil. In February 1832, I sowed down four acres of orchard grass seed (*Dactylis Glomerata*) on high fresh land. This soil was somewhat clayey, and naturally fertile, with a good deal of small hornblende and feldspar stones in it. I had left the lofty oaks standing upon it, about one hundred or a hundred and fifty feet apart; two bushels of my fine clean seed were put upon an acre with some red clover seed and oats—it came up very finely, and flourished until June, when we had a drought with great heat; the grass began to turn yellow in patches on the poor spots, when gypsum was applied at the rate of one bushel to the acre, this caused an immediate change in the grass—it became green and went on growing finely: in August it made an effort to seed, but they became blasted and faded. During seeding time, the grass faded and declined, but in September it began to spring again, and grew until January, when it stopped growing, but continued green underneath all winter. Early in March, 1833, it began to grow again, and flourished in an encouraging manner; in the winter, it received a pretty liberal supply of cotton-seed manure, and in June, it got a bushel of gypsum to the acre: it would have afforded rich pasturage during this spring, but being anxious to make seed, it was reserved for that purpose. In July and August, it made again another effort to seed, but the heads all blasted, the grass again partially died down; but in September it sprung up and held on the same course as of the year before.

Early in March 1834, it was ready for pasturing and fifteen mules were pastured on it every night, and every Sunday, until the latter part of July; it bore the pasturing admirably well, and was of the most substantial benefit to the mules, who would recruit on it in a short time. The mules, were again pastured on it in the autumn. Early in March, 1835, it was again ready for the mules; it had received another coat of cotton-seed manure in the winter, and grew vigorously; it was of equal service to animals this year, as it was during the last; but in August and September, it manifested a disposition to die out and to become thin on the ground. In the spring of 1836 (this year,) it had so died out as to furnish no valuable pasturage, so that I consider it has run its course, and is a failure. For it must be kept in mind, that a grass which requires cultivation with a plough or hoe, or a grass that requires very frequent sowing, which will not make seed, and where seed is costly, as this seed is, cannot be cultivated to profit with us. It is worth remarking, that this grass, in very rich spots, grew most luxuriantly, to the length of eight and ten feet; and that it grew every whit as well under the shade of the oaks, up to close around the foot of the trunks, as any where else.

In February, 1834, I sowed, broad-cast, a lot of high land, inclined to be sandy, with the tall mea-

dow oat grass seed, (*Avena Elatior.*) The lot was highly manured, and the gass came up and looked green and vigorous; but when the heats of summer came upon it, it began to die out, and by the month of September there was scarcely a plant of it to be found.

In February of the same year, (1834,) I sowed a lot of herds-grass, or red top (*Argastis vulgaris,*) on rich river bottom land, inclining to be stiff, and dry enough for the culture of corn; the grass came up well, and continued green all the year, but never rose six inches above the ground, and in the second year had nearly disappeared.

In February of the same year, (1834,) I sowed a lot down with furze grass, on the same kind of river bottom as the last. It came up well, and continued green all the year, but never grew more than six or eight inches high; and in the second year had nearly disappeared.

In February of the same year, (1834,) I sowed a lot down with the seed of green sward, (*Poa viridis,*) on the same kind of river bottom as the two last. It came up well and flourished. It keeps green all the year, and what is important, it keeps its verdure and continues to grow, apparently, as well in the winter as in the warm season. It is naturally a short grass, and with me it is not more than two or three inches in length: it grows very thick on the ground, and is a fine soft grass. It promises to occupy the ground in a very durable manner, as it now has as firm a hold of the lot as it had the first year. And although it would not warrant the employment of valuable planting lands in this grass, yet I cannot but think if the waste stiff bottom lands on our rivers were put down in it, it would be found extremely valuable for sheep pastures. It has every appearance of being most peculiarly adapted to that animal, and particularly for winter pasturage. I have several lots of *Leersia Oryzoides* on rich boggy grounds, which some years will yield spontaneously heavy returns of excellent hay. It is an excellent grass, and grows extremely thick and rank on [wet] land, with a season exactly adapted to it; but it requires a very moist soil, which, in a wet year, as the present has been, becomes too wet to make the hay; and if it should be a much dryer soil, it will fail entirely in a dry season. This uncertainty, of course, detracts from its value; nevertheless, it is still a valuable grass, and those who have soils adapted to it would do well to cultivate it.

I have reserved an account of the Gama-grass for the last, although in the order of time it was one of my early experiments. I have done so, because it has flattered me with a much better prospect of success than any other grass, and therefore I have more to say on the subject. In the summer of 1832, I collected, with difficulty, as much Gama-grass seed as would plant a small lot. It was planted in December, (in drills eighteen inches apart,) of that year, on a sandy lot, pretty highly manured. It came up in the April following, and grew off flourishingly, which it has continued to do ever since. Being desirous of increasing my seed, I have reserved it to the present time for that purpose, and have neither fed it down nor cut it, except some small parcels, which I cut to ascertain how it would be eaten by the horses and mules, both by way of soiling and in the form of hay; which experiments have been fully satisfactory: as I have stood by, and have seen the horses, with sweet corn blades and Gama-grass hay before them, eat of each, without discrimination or preference for either—partaking first of one, and then of the other. They eat it greedily also in the withered state, by way of what is termed soiling. The grass on this plot grows with prodigious luxuriousness, the blades getting the length of ten and twelve feet, and forming a sward on the ground, as it bends down and settles, of the depth of eighteen or twenty-four inches. I have been sedulously engaged in collecting seeds from this lot, and from other sources, for which I have paid twenty-five cents a quart, or ten dollars per bushel, until I have now a lot of three or four acres on rich alluvial bottom lands. The grass here is luxuriant and fine, and next year I expect to reap a most abundant harvest from it. It has been apprehended by some, that this grass is too coarse to be eaten by horses and mules; but I am fully persuaded, indeed convinced, that this is a groundless apprehension. My own limited trials, and authenticated trials from various quarters, all concur to show, that these animals not only eat it, but they eat it with avidity. It is true it may be left to stand without cutting, until it gets too old and tough; but there is no necessity for this. Its growth is so rapid that it may be cut every month, and even at shorter intervals from April until frost, of a length of from twelve to twenty-four inches. When in this young state, it is as succulent, tender and nutritious, as any grass I ever saw.

The only objection I know of to this grass, or rather the only difficulty attending its culture, (for, in fact, I know of no objection to it,) is the difficulty and tardiness of propagating it. It yields seed in abundance, but still they are scarce, and what is likely to keep them so, is the singular manner in which the seeds mature: they form in a spike at the top of a tall seed stalk, and mature only one seed at a time. Its maturity is readily known by its dark chocolate color, but if not gathered at once, it is apt to be lost. The seed seldom adheres to the spike after maturity longer than thirty-six or forty-eight hours, and when it falls, it is concealed in so dense a sward that it is utterly useless to look after it. Of course the collection of the seeds is a most tedious process, requiring the daily attendance of hands for several weeks; and although the mature seeds vegetate with sufficient certainty, if planted in November or December, yet from the carelessness of the collectors, and especially when collected for sale, many unripe seeds are sure to be gathered, which renders their vegetation very precarious. This circumstance will doubtless retard its extension and rapid propagation, but I feel confident, it will inevitably work its way, and ultimately be found on every plantation, and then will be esteemed as second only to the richest staple production in the state. Besides its abundant yield, and its nutritious qualities, it has some certain habitudes peculiar to itself alone, which recommend its culture. In the first place, such is its special adaptations to our climate and soil, it revels with luxuriance on sandy pine lands, on stiff lands, and light lands, on the rich alluvial soil of the river bottoms, and on the highest and dryest soils, and on the moist lands of the water courses. I have never seen it growing on boggy lands, but I have seen it on the sides of creeks where it was subject to be overflowed by every

freshet, and there it grows so rank and vigorous, as to show that it delights in those inundations. Again, it is not only perennial, but it forms larger and stronger roots every year, and grows ranker and stronger, and the period at which it may die out is entirely unknown. But, forming a conjecture from such circumstances as are known, it is, doubtless, a plant of many years duration. Indeed, so strong a possession does it take of the land, that after five years growth it will be impracticable to reclaim the land from it, but by the mattock and grubbing hoe. No plough in this country can do any thing with it. These are rare habits of the plant, and will strike every one as rendering it invaluable; for no grass will be found profitable which requires much pains to cultivate it, and keep it set upon the lands. And moreover, if the seeds could once be had cheaply and abundantly, it could not fail to prove one of the most powerful restorers and fertilizers of our exhausted fields and hill-sides, that has ever been tried. When once well set, all washing of the land would be at an end; and if suffered to grow uncut and unfed for four or five years, to shade the land in summer, and to spread its own substance on the land to rot in winter, it could not fail to make the poorest exhausted old field extremely rich. It would require labor to grub up the roots and reclaim the land; but when done, the roots alone would give a rich supply of manure.

I have given you these facts from the record, as I have kept a book, in which I have carefully written the dates, circumstances, and results of every experiment I have made. Although apparently unimportant, the communication of them may nevertheless, perchance, be productive of some good; and, if I should live, I may, at a future time, trouble you with some further communications.

JAMES DAVIS, M. D.

From the Gardener's Magazine.

HORSE CHESTNUT.

The following method of propagating this beautiful tree was communicated for the *N. E. Farmer*, vol. vii. p. 102, by Hon. O. Fiske, of Worcester.

For some years I took various means to obtain the vegetation of this nut, but without success. The last parcel I planted without effect I emptied on the grass until I was ready to institute some other scientific process. In planting them I accidentally and very fortunately left one. It was in leaf when I first discovered it. By a careful removal to a favorable soil it has become a fine bearing tree. All the rest perished as heretofore. Since this discovery I have not found the least difficulty. I endeavor to imitate nature in her planting the seeds of the forest.

Soon after the nuts are gathered, not allowing them to become dry, I make a slight excavation by the side of some bank in my garden, and spread them in, levelling them nearly with the surface. Care should be taken to lay the side from whence the root issues next to the earth. This posture gives the root a more speedy access to nourishment, and facilitates the exit of the stem. I then cover them with leaves or some light rubbish, and replace as much earth as is necessary to keep the covering in place. By the time the ground is ready to receive them in the spring, I find them sprouted without the loss of one in a hundred. To disengage them from the earth, after removing the covering I pass a stable-fork under the mass, and gently pry them up, taking out the nuts singly and carefully, to prevent breaking the long tender root, and transplant them in trenches. In this process I make the holes with a trowel deeper than the extent of the root. After partially filling them with light earth, I draw up the nut to within about an inch of the surface, leaving it just buried beneath it. I generally take them up the second year and cut off the tap root, that they may be removed with more ease and safety when large enough to be transplanted from the nursery.

This tree is peculiar in its process, taxing the patience of the cultivator in its early stages. The annual growth is finished about the last of June, when other trees are in their most vigorous progress. In the fifth season the stature is doubled. At this period it grows with the vigor and rapidity of other trees.

From the Village Record.

STRAWBERRIES.

I have been induced to make the present communication, from having been informed by a young man from near Salem, of the management of a bed in his father's garden, which he planted about twenty years ago, and which still continues very productive. It contains about two square perches, and the present season twenty quarts were gathered in a morning, and strawberries measuring three inches and three-fourths round, were frequently found. The manner in which this bed has been managed, and made so productive, is, as soon as the fruit is all gathered, mow the vines close off, and cover the bed four or five inches with rotten wood, drawn fresh from the land, where old logs have been left to decay. The strawberry vines will shoot through this covering and there will be no farther labor necessary but to keep the running vines cut off, to prevent their taking root; twelve inches square was the distance at which the plants of the above described bed were planted.

Extract from *Miscellanea Curiosa*, published in 1707.

CLAYTON'S LETTERS FROM VIRGINIA, IN 1688.

A Letter from Mr. John Clayton Rector of Crofton at Wakefield in Yorkshire, to the Royal Society, May 12, 1688, *given an account of several observables in Virginia, and in his voyage thither, more particularly concerning the air.*

Having oftentimes been urged to give an account of *Virginia* by several of the worthy members of the Royal Society, I cannot but, as far forth as I am able, obey commands whereby I'm so much honour'd, and show my respect by my ready compliance; tho' I am so sensible of my own weakness and incapacity to answer your expectations, that before-hand I must apologize

for my self. And indeed by sea I lost all my books, chymical instruments, glasses and microscopes, which rendered me uncapable of making those remarks and observations I had designed: they were all cast away in Captain *Win's* ship, as they were to follow me; and *Virginia* being a country where one cannot furnish one's self again with such things, I was discouraged from making so diligent a scrutiny as otherwise I might have done, so that I took very few minutes down in writing; and therefore, since I have only my memory to rely on, which too has the disadvantage of it's own weakness and of the distance of two years since now I left the country, if future relations shall in some small points make out my mistake, I thought this requisite to justify my candor; for I ever judg'd it villanous to impose in matters of fact; but descriptions of things that depend on memory may be liable to mistakes, and yet the sincerity of the person that delivers them intire. But hereof I shall be as cautious as possible, and shall rather wave some things whereof I have some doubts, and am uncapable now of satisfying my self, than in any sort presume too far. The method I design is, first, to give an account of the air, and all such observations as refer thereto; then of the water, the earth and soil; the birds, the beasts, the fishes, the plants, the insects; and lastly, the present state of the inhabitants: But at present I shall neither trouble you nor my self with any more than an account of what refers to the air alone, being conscious the honorable society may receive such a glut with the imperfection of this, as to excuse me from a farther relation.

But before I begin, perhaps it may not be impertinent to acquaint you with some things that happen'd in our voyage. We sail'd in the ship *Judith*, Captain *Trim* commander: 'twas fly-boat built, about 200 or 250 tuns; she sprung a considerable leak. When the captain had made long and diligent search, had tried all methods that sea-men use upon such occasions, or he could think of, all in vain, and that the leak encreased, he came pensively to consult me. Discoursing with him about it, and understanding that the ship was ceiled within, so that though the leak might possibly be in the fore-part, it would fill the whole cavity betwixt the ceiling and the planks, and so run into the hold at all the crevices of the ceiling up and down: I thereupon conceived, that where it burst in betwixt the ceiling and the planks, it must needs make some noise. He told me, they had endeavored to find it out that way, and according to custom had clapt cans to their ears to hear with; but the working of the ship, the tackle and the sea, made such a noise, that they could discover nothing thereby. I happily bethought my self of the speaking trumpet; and having one which I had contrived for some other conveniences, of a differing shape from the common sorts, I bid him take it and apply the broad end to the side of the ship, the narrow end to his ear, and it would encrease his hearing as much as it augmented the voice the other way, and would ward the ear too from the confusion of foreign noise. Upon the first application, accordingly they heard it, tho' it happened to be at a considerable distance; and when they removed the trumpet nigher, they heard it as if it had been the current of a mighty river, even so distinctly, as to have apprehensions of the bigness and figure of the hole that the water came in at; so that cutting there the ceiling of the ship, they immediately stopt the leak.

In the sea I saw many little things which the seamen call carvels; they are like a jelly or starch that is made with a cast of blue in it; they swim like a small sheep's bladder above the water: downwards there are long fibrous strings, some whereof I have found near a half a yard long. This I take to be a sort of sea plant, and the strings, its roots growing in the sea, as duck-weed does in ponds. It may be reckon'd among the potential cauteries; for when we were one day becalm'd, getting some to make observations thereof, the sportful people rub'd it on one another's hands and faces, and where it touch'd it would make it look very red, and make it smart worse than a nettle. In my return for *England* we struck a hauksbill turtle, in whose guts I found many of these carvels; so that it's manifest they feed thereon.

'Tis commonly asserted by the seamen, that they can smell the pines at *Virginia* several leagues at sea before they see land, but I could receive no satisfaction as to this point; I could not discern any such thing when at a moderate distance. I fear much of this may be attributed to fancy; for one day there came three or four, full scent, to tell me they were certain they smelt the pines; but it afterwards prov'd that we were at that time 200 leagues from the shoar, so that I was satisfied that was therefore meer fancy. Indeed we thought, by the general accounts of the ship, that we had been just on the coast, but all were deceived by a current we met with, that at that time set about south-east, or east-south-east, which when once becalmed we tried thus: We hoised out a boat, and took one of the scuttles that cover'd one of the hatches of the ship, tying thereto a great weight, and a strong long rope, we let it sink a considerable depth, and then fastning it to the boat, it serv'd as an anchor, that the boat could not drive; then with the glass and logg line we found the current set, as I say, eastward, at the rate of a mile and a half an hour. This current is of mischevous consequence: it does not always run one way, but as it sets sometimes as we proved easterly, so does it, as they say, set at other times westerly, whereby many ships have been lost; for then the ships being before their accounts, they fall in with the land before they are aware. Thus one year many ships were lost on Cape *Hattarasse*, and thereabouts.

Of the Air.

The cape called *Cape Henry*, lies in 36½ of the northern latitude. The air and temperature of the seasons is much govern'd by winds in *Virginia*, both as to heat and cold, driness and moisture, whose variations being very notable, I the more lamented the loss of my barometers and thermometers, for considerable observations might be made thereby, there being often great and suddain changes. The Nore and Nore-West are very nitrous and piercing, cold and clear, or else stormy. The south-east and south hazy and soultry hot. Their winter is a fine clear air, and dry, which renders it very pleasant: Their frosts are short, but sometimes very sharp, that it will freeze the rivers over three miles broad; nay, the Secretary of State assured me, it had frozen clear over *Po-*

tomack River, over against his house, where it is near nine miles over: I have observed it freezes there the hardest, when from a moist south-east, on a sudden the wind passing by the nore, a nitrous sharp nore-west blows; not with high gusts, but with a cutting brisk air, and those soils then that seem to be shelter'd from the wind, and lie warm, where the air is most stagnant and moist, are frozen the hardest, and seized the soonest, and there the fruits are more subject to blast than where the air has a free notion. Snow falls sometimes in pretty quantity, but rarely continues there above a day or two: Their spring is about a month earlier than in *England;* in *April* they have frequent rains, sometimes several short and suddain gusts. *May* and *June* the heat encreases, and it is much like our summer, being mitigated with gentle breezes that rise about 9 of the clock, and decrease and incline as the sun rises and falls. *July* and *August* those breezes cease, and the air becomes stagnant, that the heat is violent and troublesome. In *September* the weather usually breaks, suddenly, and there falls generally very considerable rains. When the weather breaks, many fall sick, this being the time of an endemical sickness, for seasonings, cachexes, fluxes, scorbutical dropsies, gripes, or the like, which I have attributed to this reason: that by the extraordinary heat the ferment of the blood being raised too high, and the tone of the stomach relaxed, when the weather breaks the blood palls, and like over-fermented liquors is depauperated, or turns eager and sharp. and there's a crude digeston, whence the named distempers may be supposed to ensue. And for confirmation, I have observed the carminative seeds, such as warm. and whose oil sheaths the acid humours that ever result from crude digestions. But decoctions that retain the tone of the stomach, as I suppose, by the making the little glands in the tunicles of the stomach squeeze out their juice, (for what is bitter may be as well offensive to the stomach, as to the palate) and then chalibiates that raise the decayed ferment, are no bad practice; after which, I conceive, armoniack spirits might be very beneficial. But their doctors are so learned, that I never met with any of them that understood what armoniack spirits were: Two or three of them one time ran me clear down by consent, that they were vomitive, and that they never used any thing for that purpose but crocus metallorum; which indeed every house keeps; and if their finger, as the saying is, ake but, they immediately give three or four spoonfuls thereof; if this fail, they give him a second dose, then perhaps purge them with 15 or 20 grains of the rosin of jalap, afterwards sweat them with *Venice* treacle, powder af snake-root, or *Gascoin's* powder; and when these fail *conclamatum est*. But to return. 'Tis wonderful what influence the air has over men's bodies, whereof I had my self sad assurances; for tho' I was in a very close warm room, where was a fire constantly kept, yet there was not the least alteration or change, whereof I was not sensible when I was sick of the gripes, of which distemper I may give a farther account in its proper place. When a very ingenious gentlewoman was visited with the same distemper, I had the opportunity of making very considerable observations. I stood at the window, and could view the clouds arise: For there small black fleeting clouds will arise, and be swiftly carry'd cross the whole element; and as these clouds arose, and came nigher, her torments were encreased, which were grievous as a laboring woman's; there was not the least cloud but lamentably affected her, and that at a considerable distance; but by her shrieks it seemed more or less, according to the bigness and nearness of the clouds. The thunder there is attended often with fatal circumstances: I was with my Lord *Howard* of *Effingham*, the governor, when they brought word that one Dr. *A.* was killed therewith, after this manner: He was smoaking a pipe of tobacco, and looking out at his window when he was struck dead, and immediately became so stiff, that he did not fall, but stood leaning in the window, with the pipe in his mouth. in the same posture he was in when struck. But this I only deliver as report, tho' I heard the same account from several, without any contradicting it. These things are remarkable, that it generally breaks in at the gable end of the houses, and often kills persons in, or near the chimneys range, darting most fiercely down the funnel of the chimney, more especially if there be a fire, (I speak here confusedly of thunder and lightning for when they do any mischief, the crash and lightning are at the same instant, which must be from the nearness of the cloud.) One time when the thunder split the mast of a boat at *James Town*, I saw it break from the cloud, which it divided in two, and seem'd as if it had shot them immediately a mile asunder, to the eye: It is dangerous when it thunders standing in a narrow passage, where there's a thorough passage, or in a room betwixt two windows; tho' several have been kill'd in the open fields. 'Tis incredible to tell how it will strike large oaks, shatter and shiver them, sometimes twisting round a tree, sometimes as if it struck the tree backwards and forwards. I had noted a fine spreading oak in *James Town* Island: in the morning I saw it fair and flourishing, in the evening I observed all the bark of the body of the tree, as if it had been artificially peel'd off—was orderly spread round the tree, in a ring, whose semi-diameter was four yards, the tree in the centre; all the body of the tree was shaken and split, but its boughs had all their bark on; few leaves were fallen, and those on the boughs as fresh as in the morning, but gradually afterwards withered, as on a tree that is fallen. I have seen several vast oaks and other timber trees twisted, as if it had been a small willow that a man had twisted with his hand, which I could suppose had been done by nothing but the thunder. I have been told by very serious planters, that 30 or 40 years since, when the country was not so open, the thunder was more fierce, and that sometimes after violent thunder and rain, the roads would seem to have perfect casts of brimstone; and 'tis frequent after much thunder and lightning for the air to have a perfect sulphurious smell. Durst I offer my weak reasons when I write to so great masters thereof, I should here consider the nature of thunder, and compare it with some sulphurious spirits which I have drawn from coals, that I could no way condense, yet were inflammable; nay, would burn after they passed through water, and that seemingly fiercer, if they were not over-power'd therewith. I have kept of this spirit a considerable time in bladders; and tho' it appeared as if they were only blown with air, yet if I let it forth, and

fired it with a match or candle, it would continue burning till all were spent. It might be worthy consideration likewise, whether those frequent thunders proceeded from the air's being more stagnant, the motion of the winds being impeded by the trees, or whether the motion of the winds being obstructed by them below, the motion might not be more violent aloft; and how far that may promote inflammability, for stacks of hay or corn that ferment with moisture, never burn, unless when brisk winds blow, that agitate and fan the little fermenting sparks, and often kindle them into an actual fire. And observance of the meteors there might perhaps not be impertinent, as both what are more rare, and what are more frequent, as of *Gosimore* in great abundance, and of those small cobwebs in a morning, which some have supposed to be meteors. *Ignes fatui*, tho' there be many boggy swamps and marshes, are seldom, if any are seen there. There be frequent little sorts of whirl-winds, whose diameter may be sometimes not past two or three yards, sometimes forty, which whisking round in a circle, pass along the earth, according to the motion of the cloud, from whence they issue; and as they pass along with their gyrous or circular motion, they carry aloft the dry leaves into the air, which fall again often in places far remote. I have seen them descend in a calm sun-shine day, as if they had come from the heavens in great showers thereof, so that all the elements seem'd filled therewith. And I could perceive them to descend from on high as far as I could possibly discern a leaf. I remember a roguish expression of a seamen, otherwise silly enough, who wondering thereat, cry'd out, "*Sure now 'tis manifest there is a world above!* and now with them 'tis the fall of the leaf." But to proceed, I thought this made it manifest, whence many preternatural showers have happen'd. I remember at Sir *Richard Atherton's* in *Lancashire*, some few years ago, there fell a great number of the seeds of ivy-berries; at first we admir'd what they were, for they were cover'd with a thin skin that was red, and resembled the figure of a small wheat corn; but afterwards they fully manifested what they were; for many sprouted and took root. I suppose they were carry'd aloft by some such whirl-wind, and let fall there. I have purposely gone into the place where I perceived this gust, which is notorious enough by the noise it makes, with rattling the leaves as it carries them aloft, and have found a fine sharp breeze of wind.

[To be continued.]

From the New York Farmer.

MECHANICAL USES OF LIME.

Preparation of Quicklime.

Under the general name of limestones are comprehendeded all mineral substances which contain not less than half their weight of carbonate of lime. Quick lime is prepared from most of these limestones, by calcination, and is characterized by the property of absorbing water with phenomena of heat, an action which, if it also cause the lime to fall to powder, is called slaking. Lime prepared from different varieties of limestone has different properties in this respect. In some cases the action is rapid and violent, the heat produced, great; in others the operation is more slow, and the heat less intense. There are also, limestones which after calcination will not slake. The limestones which are richest in carbonate of lime belong to the first variety; those which contain carbonate of magnesia in a proportion greater than 10 per cent. to the second; while the resistance to the action of the slaking in the third, is due to the presence of argillaceous matter. The two first varieties are alone suited to the preparation of mortar. The last variety will not make mortar in the usual manner, but is nevertheless of great value as an ingredient in cements which will resist the action of water. In the act of slaking quick lime, which retains, after calcination, the shape and structure of the limestone whence it is prepared, falls, as has been stated, to fine powder. It also falls to powder after exposure to the air, when it is said to be air slacked. In the first case the lime combines with water forming a solid hydrate; in the latter it absorbs carbonic acid from the atmosphere, and returns to the same chemical state which the limestone possessed before calcination.

The calcination, or, as it is usually styled *burning* of lime, is performed in chambers built of stone, which go by the name of kilns. Of these there are two descriptions, ordinary and perpetual. The ordinary lime kiln is of the shape of a truncated cone, or of a portion of an ellipsoid. The limestone is prepared for calcination by breaking it into pieces, none of which have a greater dimension than 3 or 4 in. cube. The large fragments of limestone are employed in building a rude vault, over a cavity left in the lower part of the kiln. To this cavity an entrance or door is left in the wall of the kiln. The rest of the kiln is filled up with smaller pieces. When wood is used as fuel, it is introduced by the door into the space beneath the vault, and is burnt on the floor of the kiln. When coal or turf are employed, an iron grate is provided, on which the fuel is placed, leaving an ash-pit beneath. In building the vault, the spaces between the stones are left of as great an area as possible, and in filling the kiln the largest of the remaining pieces are laid next to the vault, while the smallest fragments are used for covering the rest, and closing the top of the kiln.

The fire is at first moderate, in order that the limestone may be gradually heated. After 10 or 12 hours the quantity of fuel is gradually increased, until the mass of limestone is brought nearly to a white heat. After it has been kept for some hours at this temperature, the bulk of the mass of limestone decreases about one-sixth, and flame issues almost free from smoke, from the top of the kiln. The intensity of the heat is then gradually diminished until the fire is permitted to extinguish itself, for want of fuel. In order to complete the calcination of a given bulk of limestone in an ordinary kiln, nearly three times its volume of wood, or twice its volume of turf or coal is required. Much of this quantity of fuel is consumed in the gradual heating of the limestone and in preventing it from cooling too rapidly after the calcination is complete. It is therefore obvious that in a kiln in which the operation might be kept up without ceasing, a considerable saving of fuel might be ensured. Such a kiln is said to be perpetual. The first attempt at the construction of a perpetual kiln was made by Count Rumford.

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Preparation and Uses of Mortar.

Rationale.—When the hydrate obtained by slacking quicklime is mixed with water to the consistence of paste, a small portion of the lime is dissolved; the dissolved lime attracts carbonic acid from the atmosphere, and is precipitated upon that which remains undissolved, the water is thus left free to dissolve a new portion of the lime which is in its turn precipitated, and this successive action will be continued so long as mosture is present, or any portion of quicklime remains. The cessation of the action arises more usually from the loss of moisture by evaporation, than from the complete solution of the quicklime. A portion of the latter therefore remains, which is gradually converted into carbonate, and thus the semi-liquid paste is gradually converted into a white solid possessing but little adhesion. If silica be mixed with the lime and water, the precipitation of the carbonate takes place upon it in preference, and the adhesion between them is stronger than in the former instance. Indeed, it appears as if the chemical affinity which exists between lime and silica influences the adhesion, and that the conversion of the carbonate into silicate of lime begins, and continues to go on for ages. It is only in this way that we can account for the long series of years which elapses before mortar attains its limits of hardness, and a force of aggregation often superior to that of the limestone whence it is made. The theory of the formation of a silicate of lime is also corroborated by the act, that even in the most ancient and hardest mortars, the quantity of carbonic acid which is present, is alway less than would be required to convert the lime into carbonate. For the same reason that the adhesion of the precipitated carbonate of lime to silica is greater than to other portions of lime or carbonate, the adhesion of mortar to brick or siliceous stones is greater than to limestone. It is however necessary in all cases that the stone or other material which is to be laid in the mortar be moist, or at least do not absorb moisture. If the material absorb water from the mortar, the solution and precipitation no longer take place, and no adhesion will ensue between the mortar and the stone. In laying brick, therefore, it is necessary that it be wet before the mortar is applied, otherwise no bond will take place.

Preparation.—The lime intended for the manufacture of mortar should be either recently burnt, or should have been carefully preserved from the action of air.

Lime which has been long slaked will make as good mortar as recent quicklime, provided the latter condition have been attended to, but as it is more difficult to judge of the freedom from carbonic acid in slaked than in quicklime, it is considered preferable to use the latter rather than the former.

When the lime is prepared from a stone which is free from impurities, it slakes readily, and may be converted into mortar as the art of slaking is going forward. For this purpose, a sort of basin is formed on the ground, by means of the sand intended to enter into the composition of the mortar. The lime is thrown into the middle of this basin, and water gradually poured over it. The quantity of water must be sufficient not merely to form the solid hydrate, but to convert it into the mechanical mixture known as the milk of lime. As the quicklime falls to powder, it is gradually incorporated with the sand and water by means of a hoe, which is also of use in breaking down those parts of the lime which longest resist the action of the water.

If the lime be combined with magnesia, it slakes too slowly to permit this method to be employed. Such lime should be placed in a conical pit, water thrown upon it, and then covered up with the sand intended to be mixed with it. Days, or even weeks may elapse, before the whole mass shall have fallen to powder, but after the disintegration is complete, such lime will make as good a mortar as that prepared from a pure carbonate. It is more usual to slake such lime in the neighborhood of the kiln, and to separate the parts which have not fallen to powder by means of a screen, but this method is objectionable, as the finer and richer portions are liable to be charged with carbonic acid before they can be transported to the place where the mortar is to be prepared. A method which is preferable to either, consists in plunging the magnesian lime into a vessel of water, where it is permitted to remain until completely pulverized. The excess of water is then drawn off, and the lime with the residue of water incorporated with sand. The sand which is to be used in making mortar, ought to be made up of angular fragments of quartz. Such sand is found in the bed of running streams, or in diluvial and alluvial deposites from running water. It is designated by masons by the epithet sharp. A mixture of argillaceous matter deprives it of this quality, but as this may be separated by agitation with water, the necessary sharpness may often be acquired by washing the sand.

For laying brick or well jointed stone, fine sand is to be preferred; for common hewn stone, sand of coarser grain; and for rubble work, the mortar made with coarse sand should be mixed with small pebbles, or rather with angular fragments of a siliceous stone.

The best proportion of the materials of mortars, is one part of a pure quicklime to three of fine or four of coarse sand. If the lime be of less purity, the qantity of sand must be lessened in such manner as to bear the same proportion to the pure earth contained in the limestone.

The rapidity with which mortar sets may be much increased by the use of quicklime, ground to powder, instead of being reduced to that form by slaking. This method is the invention of Loriot, a French engineer, who supposed he had discovered the secret of the hardness of the ancient mortars. He directs that three parts of slacked lime be mixed with four of water, and that sixteen parts of pulverized brick or sand be added. After these materials are thoroughly mixed one part of quicklime ground to fine powder is to be added. This mortar has not all the valuable properties which were anticipated by its inventor. It might however, be used to advantage in building in frosty weather.

Limestones which contain siliceous or argillaceous matter are fit for the preparation of mortar, so long as the lime prepared from them retains the property of slaking, but the proportion of sand with which they can be mixed must be still further lessened by the bulk of the other earths contained in the limestone.

Hydraulic Cement.

History.—The ancients were acquainted with a substance which, when mixed with a pure quicklime and water, formed a mixture that possessed the property of hardening under water. This is a volcanic product having the form of powder, originally found at Puteoli in the neighborhood of Vesuvius, and called from the locality *Terra Puteolana*. The material is still used on the shores of the Mediterranean and is called Puzzolana.

The wants of the people of the low countries led them to seek in their own vicinity for a substitute for Puzzolana. This was found in a rock furnished by extinct volcanoes, whose traces are to be seen on the banks of the Rhine. This differs from Puzzolana in requiring a calcination to prepare it for use, and when calcined it absorbs moisture so readily that it must be carefully preserved from contact with the air, unless it be used within a short time of its manufacture. During the sixty years war, the people of Holland were cut off from a supply of this important article. In order to replace it, earth was drawn up from bottoms of their canals, formed into brick, burnt, and pulverized. This article was found to be nearly as efficacious as the native product, and both go by the common name of Terras or Trass.

Not only is there a substance which when mixed with pure lime makes an hydraulic cement, but these are varieties of limestone, which are characterized by refusing to slake when water is poured upon them, that when mixed with sand have the same valuable property. The discovery of this property seems to have been accidental, and its date unknown. Such limestones were first worked at Aberthaw in England, and Salenches in France. When the construction of the New York Canals was commenced, such limestones were found in its vicinity, and since that period quarries of the same description have been opened in various parts of the United States. It may indeed be inferred that there is hardly any calcareous formation some of the layers of which do not possess this property.

Even where native Puzzolana, Terras, or an hydraulic lime are all wanting, the example of Holland shows that artificial substitutes may be found wherever clay can be obtained.

Of all the materials for the preparation of an hydrulic cement, those which contain within themselves all the nacessary substances, and thus require no foreign matter to be mixed with them, seem to be best. Such are the septariæ found in the London Clay and used in the preparation of "Roman Cement."

Rationale.—If the scale of a smiths forge, or the black oxide of iron in any other form, is mixed with common mortar, it acquires the property of setting more rapidly, and speedily becomes so hard as to resist the action of water. Clays rich in ferruginous matter, if burnt and reduced to powder, have the same effect upon lime. It was also found that the native Terras contained from 10 to 15 per cent. of oxide of iron. It was inferred from these facts, that the property possessed by a cement of setting in water, was due to the presence of oxide of iron. Some of the most valuable hydraulic limes however, contain little or no iron, and Puzzolana is also poor in that substance. An isolated observation subsequently led to the ascription of the hydraulic property to the presence of oxide of manganese. Another view of the subject led to the hypothesis that hydraulic cement was obtained from a sub-carbonate of lime, the limestones from which it was prepared being in such a state of combination that heat could not expel more than half their carbonic acid. The theory which is now received is that of Vicat, who infers that hydraulic cement is obtained, whenever a silicate of lime is either formed in the calcination of the limestone, or generated rapidly by the action of the substances with which a pure lime is mixed. This silicate has the property of combining readily with water, and then the aqueous part of the cement speedily becomes solid. To this we may add that the ternary compounds of silica are formed with more readiness than the binary, and thus metallic oxides, alumina, and probably other earths concur in hastening the formation of the solid hydrated silicates.

Puzzolana.

Hydraulic cement may be made of Puzzolana, by mixing nine measures of a pure quicklime, or an equivalent quantity of that which is less pure, with water, and twelve measures of Puzzolana, and six measures of good sharp sand. If the place where it is to be employed in the erection of masonry is so situated that the stones may be laid above the level of water, no other preparation is necessary than in the use of common mortar. If it is to be used below the usual level of a mass of water, a coffer dam may be constructed. This is a case formed of piles and pileplank driven into the bed of the mass of water, in such manner as to resist its passage. After the coffer dam is finished, the water inclosed within it is raised by a pump, or other appropriate hydraulic engine, and the work is performed, after the water is thus discharged, precisely as if it were common masonry. When the bed is level, or can be rendered so, a caisson may be employed. This is a water-tight vessel whose bottom is flat, and whose sides are vertical. It is made large enough to contain the proposed structure and at the same time have room for the workmen and necessary scaffolding. The caisson is buoyant, and floats at the surface of the water. The building materials are introduced into it, and covered up in regular courses from its bottom. As the work advances the caisson sinks, until it rests upon the bed. After the structure has been raised above the level of the surface of the water, the sides of the caisson may be removed, but the timber bottom remains as a foundation for the masonry. Stone may also be laid in hydraulic cement beneath the surface of a mass of water by means of the diving bell.

A more rapid mode of construction was employed by the ancients, and is still used in the ports of the Mediterranean. Instead of a tight coffer dam, a mere enclosure of woodwork is formed in the water, inclosing a space of the figure of the contemplated structure. To 27 measures of hydraulic cement, made as has just been described, 16 measures of pebbles or chip stone are added, and the whole incorporated by stirring it for an hour, either with a hoe in the hands of a workman, or by the aid of machinery. The mixture is then formed into a conoidal heap, and allowed to remain at rest until a hard crust is formed

on its surface. This will happen in warm dry weather in five or six hours, but in moist weather, some days may elapse before the cement acquires a proper degree of consistence. The mass is then broken up by the pickaxe, and intimately mixed for the second time by agitation. No water need be added to the mass, but it will regain its fluidity by stirring. When the water in which the structure is to be built is deep, the mixture is plunged into it by mens of a wooden case of cubical shape. This is managed by means of a windlass moveable upon a rail road, and has a sliding bottom, or a shutter fastened by hinges. When this has been lowered until no more space is left than just suffices for the opening of the shutter, the latter is permitted to open, and the cement falls to the bottom. A second case full is lowered and deposite beside this, and the surface of the two masses levelled by rakes and other appropriate instruments. When a uniform bed, of about a foot in thickness over the bottom of the whole space inclosed by the wooden partition has been thus deposited and spread, blocks of stone of not more than eight inches cube are thrown upon the cement, until an entire layer of such stones has been spread over the cement, in which they are capable of partially embedding themselves by their own weight. Upon these a second layer of cement is spread by means of the case, which is followed by a second layer of stones, and thus the level of the surface of the water is reached. The case however becomes useless when the depth of water is less than twice the vertical dimensions of the case. After the structure has been raised thus high, the cement is thrown in by baskets and hods, and the last courses may even be laid by the trowel.

In Europe, the wood which encloses this structure is usually removed, and may be employed again for the same purpose, but when wood is abundant it would probably be better to leave it as a protection to the structure, until it decays, when the masonry will probably be perfectly consolidated.

Terras, both native and artificial, may be used in the same way. So also may the powder of burnt clay or brick, of calcined ochre, and roasted clay slate.

Terras is prepared from a columnar greenstone or trap rock found near Andernach on the banks of the Rhine. This is roasted and reduced to powder. A similar stone is found on the bank of the Hudson near Fort Lee, and might no doubt be used for the same purpose. Other varieties of trap rock or basalt may be prepared for a similar use, by heating them until they begin to fuse, and grinding them to powder.

Hydraulic Lime.—Hydraulic lime is calcined in the same manner as common limestone. It is prepared by grinding it in a mill to a fine powder, and ought to be kept for use in tight casks. Any limestone which contains from 9 to 10 per cent. of argillaceous matter is slighter hydraulic, and it possesses this property in perfection when the proportion of that compound amounts to 20 or 30 per cent.

An artificial cement may be prepared by mixing 3 parts of chalk with one of clay, tempering the mixture with water, forming it into bricks, calcining, and grinding to powder. Care must be taken, that, while the heat must be sufficiently intense not only to drive off the carbonic acid from the chalk, but also the last portion of water from the clay, the mixture does not begin to fuse, for, after this stage is reached, the hydrate can no longer be formed.

It was long supposed that the hydraulic limes and artificial cement could not be used in building in a mass of water, by throwing in loose stones upon a bed of cement mixed with chip stone, as described under the head of Puzzolana. But recent experiments in France have shown that this idea is unfounded, and that the hydraulic limes mixed with common sand, have all the properties of the cements of which Puzzolana or Terras form a portion. It is necessary however, to examine experimentally the length of time which they take to set beneath the surface of the water, for this will differ with the different varieties of the natural mineral; and where the rate of setting is not such as to render the mixture hard within a few hours, the mixed cement and chip stone must be allowed to lie in heaps until it becomes hard at the surface, before it is plunged into the water.

Roman Cement.—This celebrated article is prepared in England from a stone found in nodules in the geological formation called the London clay. It is a compact substance of a brown color, susceptible of high polish. It is usually divided into irregular masses by vains of crystilized carbonate of lime. The quantity of silica and alumina contained in the brown portion is sufficient to form the cement without any further addition, when it is to be used beneath the surface of water. When thus unmixed it will set, either in the open air or in contact with water, in not more than fifteen minutes. Its properties in the two cases are however different, for it does not, if used unmixed, increase in hardness after it has once set, when merely exposed to the air; but if immersed in water, or in damp position, it gradually acquires the firmness of the strongest native limestone. It should therefore never be employed pure, except when it is to be exposed to the action of water. Where it is used merely in a moist place, two parts of good sharp sand should be mixed with three of cement; if in a position exposed to frost, three parts of sand to two of cement; while in a dry and warm climate or in covering walls exposed to the sun, at least five parts of sand should be mixed with two of cement. It is probably owing to the Roman cement, when applied as a stucco, having been used pure, and laid upon dry brick, that its use has been attended with little success in this country, for when properly prepared and applied, it has borne equally well the extreme climate of Canada, and the torrid air of the West Indies. Its use also requires an experienced workman. When it is to be mixed with sand, the two materials must be thoroughly incorporated before water is added.

A stone, identical to that which the Roman cement is prepared, has been found at Boulogne, in France, and one similar in texture, and in being veined with carbonate of lime, at Cumberland in Maryland. The poor calcareous ores of iron, found in coal formations, have also been used in preparing a cement, which has all the properties of the Roman, and goes by the same name. The material whence Roman cement is prepared has also been used in England in the preparation of artificial stone. For this purpose the cement

while still liquid is poured into moulds having the figure of architectural ornaments. A similar use has recently been made of the American hydraulic cements, under the sanction of a patent.

MEMORANDA AND REFLECTIONS.

From the Journal of a Supercargo kept during a short residence in the Dutch East Indies.

Java.—Sugar and Indigo.

The contracts for sugar, though not on such advantageous terms as those for coffee, still must be exceedingly profitable to the government. The old contracts, most of which will have expired in a year or two, are at the rate 12c. or f10,00 p. picul deliverable always at the government stores. This is at the rate of $2 50 p. 100 lbs—the government furnishing to the grower of the cane, at an extremely low rate, coolies to work the same, and young cane for planting without any charge. They also advance to the manufacturer funds for building mills &c., for which they receive at contract prices the sugar until the debt is liquidated, after which they receive annually, at the stipulated price, a certain quantity of sugar—any surplus is at the command and under the control of the manufacturer—at the expiration of their contracts, the government in every case resume the lands, (it being part of their policy to continue the only possessors of the soil,) and to the manufacturer they are bound to allow a fair valuation price for his mills, &c. It is generally the case that the grower of the cane and the manufacturer of the same, are not the same individuals. The sugar, as also the coffee, undergoes an inspection. If it does not come up to the government standard, it is rejected: this in ordinary times is rigidly exacted. The sugar received at contract prices must be two-thirds of No. 1, or of inspection first quality, and one-third of No. 2, or second quality, and it is generally turned out by the manufacturer in this proportion, the lower part of the boiler mostly being of No. 2, and sometimes of very inferior sugar, the upper two-thirds of which is generally superior. The new contracts, are at the rate of 9c, equal to f7 50 per picul, or about $1 89 per 100 lbs. At these rates, J. E. Bancks and friends are as yet the only contractors. It has been found necessary by the government, in order to hold individuals who were contractors, to their agreements, and to prevent the frauds which were daily practised to devise some means to compel them to deliver their sugar as agreed upon, and a beslypt or edict has been issued this year, which will effectually prevent them disposing of sugars which actually belong to government, and which, in order to obtain a little greater price, they conceal and plead inability to comply with their contracts.

The government never insist upon a compliance in any case where they have reason to suppose it would greatly inconvenience the individual. No sugars are now to be shipped until a certificate of origin is produced, countersigned by the resident officers of the port, and signed by the resident of the place of origin—this is again signed by the comptroller of customs and regularly noted, after which a permit for shipping will be granted; the quantity shipped upon this certificate is also noted. One of the methods of deception which has been successfully practised is to get the crops which are always inspected while growing, falsely estimated, but this edict will render such deception of no avail to the individuals, and will effectually do away with this system of cheatery. To give some idea of the method in which this is managed, I will subjoin a statement of the way in which the sugar estate is valued—say there is a field of 400 cane, if they run fair and are of a flourishing appearance—five-tenths of them are noted as young cane, No. 1—three-tenths as do. No 2—two-tenths as do. No. 3—four canes are then supposed of each to produce one cane at maturity. The No. 1, or first quality cane, being in reference to the quantity of sugar it will turn out, having nothing to do with the quantity of the manufactured article, thus: [ductive in sugar.

5-10ths is	200	young cane,	50	—No. 1, or most pro-	
3-10ths is	120	" "	30	"	2, less pro'e.
2-10ths is	80	" "	20	"	3, least "
Product'e	400		100		

It will readily be seen by the foregoing statement, that with the contrivance of the inspector, the estate may be undervalued, the cane being pronounced inferior—the planter has only to deliver a certain quantity, much less than his contract.

I should have wished here, if possible, to have given the quantities of sugar which are nominally fixed as the product of No. 1, 2, or 3 cane, but was unable to obtain such information. The government, however, in their contracts, generally estimate 50ps. of sugar as the produce of every 4 acres. The sugar districts of Java are the Problinge and Baserkie districts, containing 9 mills, all of which are water mills. The districts of Passawang and Malang, with their 14 water mills—Banghill having 4 mills, likewise water mills, and Sourrabaya with its 14 mills, 8 of which are cattle and 6 water mills.

The quantity of sugar produced in 1834, and delivered in 1835, or in store that year, must have been 280,960 ps.

	Piculs.
Say from the Problinge, &c. districts,	69,000
Surrabaya district,	19,750
Passawang and regencies,	155,200
Free sugars,	37,000
Making a total of	280,950

And there is not a doubt that the next crop will greatly exceed that of 1834 and of 1835. The crops of 1837 I mean, that produced this year, 1836, and deliverable in 1837, is held in anticipation at 400,000 ps. One bow, or four acres of cane, is estimated as capable of 50 ps. of sugar—the crop this year will be as much as 65 ps. per bow—an increase of 30 per cent.

There is a land revenue to be paid by every cultivator, on the fertility of the soil, which is deducted from the amount paid by government, for the cane, the amount allowed by government is 4c, or f3,33 per pel. for cane, (all the mills under contract to government are numbered and known by this) marked on the sugar basket as the No. of the mill and the sugar district from which it comes.

Manufacture of Sugar.—The cane being ripe, is cut down and bruised, by rolling between two cylinders. The sap which issues from the cane

they bruise, is caught in vessels made for the purpose—generally they are rough troughs of bamboo—from these it is conveyed into the boilers, and heated—after it has been boiled for a certain length of time, it assumes a dark color, and is then said to be the syrup of sugar—this syrup is poured into coolers, kept in a continual state of agitation, by which means the crust which otherwise would form in the process of cooling, is broken—when the temperature has been sufficiently reduced, it is poured into casks, which are perforated in a number of places, and in the holes are placed the porous bamboo, forming a rude but effective filter through which the syrup passes, leaving the sugar behind. The sugar, which has only undergone this process, is said to be in the Muscovado state. The syrup is further strained through canvass filters, mixing it with a portion of lime; it is then transferred to the pots, which are unglazed, and a cake of wet or moist clay is superadded, forming a sort of lid; after being again heated and a similar process to the former undergone, the sugar is turned out, and becomes what is known as the once clayed sugar—if this is again renewed, it becomes twice clayed sugar. The upper two-thirds of the pot is the better sugar, classed in Java as No. 1—the remaining portion being of a quality not so good, ranks as No. 2, or perhaps as molasses sugar. The manufacture of molasses in this island is almost altogether neglected, and there is no consumpiton of the same, except of a very small quantity, which is sold for immediate use to the inhabitants, and the shipping, for the supply of their crews. It is generally of a very inferior quality, being always somewhat burnt, and is mostly thrown away—the little that is sold is worth about 8 or 10 cents per gallon, or from f 4 a 6 per picul.

Indigo is cultivated to some extent in the interior of the island, and the article is ranked by the holders as equal, if not superior, to the Bengal indigo.

Its Cultivation and Manufacture.—New lands are always preferable for the culture of this plant. It requires a strong soil; and the ground must be disturbed by the plough or harrow before the introduction of the plant. If the season is a dry one, attention must be given to the young plant to ascertain that it does not suffer by the drought, and for the first week or so it must be continually watered, after which it requires comparatively little or no care, and seems to change its nature, scarcely any moisture being now requisite to its growth—indeed if the season should continue to be a wet one, the plant, although apparently in a most luxuriant state, will be found to be deteriorated, and on manufacture, the article produced, is of an inferior quality. The leaves of the young indigo are of an extremely pale green color, but in a matured state, when ripe for the vats, it assumes a dark green. The leaves and branches, when of the latter hue, are immediately separated from the plant and spread out into the sun to dry; after a few hours they are sufficiently dry to be gathered in, when they are threshed to separate them from the branches and stems, and are then pressed in tight packages and stored until the second crop shall be gathered in; when the crops of one season are all stored, they are left to undergo a fermentation, (which fermentation must be spontaneous, care being observed that nothing of a foreign nature, which would hasten it, be present.) About forty days after the second crop is stored, the leaves will be observed to have assumed a dark cream color, and should then be immediately removed to the vats. If kept for any length of time after the change, they will become black, and upon manufacture, will afford an inferior indigo, and in less quantity. The indigo leaves are, on their change to a cream color, taken from the store and thrown into vats of about 28 feet square, two feet three or four inches in depth, which are carefully constructed of tiles on the inside, well plastered and joined together. Water is now admitted into these vats, and suffered to remain upon the leaves for about two or two and a half hours, being kept in continual agitation during this period of time by stirrers—the water is then drawn off and has become a greenish shade, when it is conveyed by means of pipes or troughs into another vat, when it is still further agitated, until at last it exhibits a dark blue color, when it is tested by pouring a small quantity into shallow pans, and if it yield freely a blue deposite, lime water is at once added, and the whole repeatedly stirred for a length of time, after which it is left to settle, and the deposite which is made is kept undisturbed for a short time after the water is drawn off—which is of an amber color. The indigo on being taken from the vat, is filtered through a straining cloth, mixed with water again and boiled, the scum and dirt as it rises during the process of ebullition, is carefully removed, and the contents of the boiler when cooled, are again strained—after which they are kneaded, and pressed into cakes of about two or two and a half inches square. These are then left to dry—after which they are packed, and in this state the article is known as the indigo of commerce.

Good indigo should be clean, hard, inflammable and free from grit or sand, very light, with a specific gravity less than that of water. If the specific gravity is greater than that of water, it would be advisable, without further test, to reject it at once. It should be of a bright fine blue color, internally marked somewhat with silvery streaks, and upon friction with the back of the nail, giving a reddish coppery cast to the surface thus rubbed. It is an article in which you are liable at any time to deception, if not a constant dealer, and a very good judge of the same.

From the Genesee Farmer.

THOUGHTS ON WARMING ROOMS.

The maintaining a proper temperature in our dwelling houses through the winter season, can only be accomplished in two ways—by excluding the external air, and preventing the escape of that already warmed.

To exclude the external air, it is necessary that much greater attention be given to their construction and finishing, than is usually paid. There is scarcely a possibility of making our rooms, in which a *wood fire* is to be kept burning, too tight; the very means adopted for carrying off the smoke will ensure a sufficient circulation, and consequent renewal of the air of the room.

Where coal is used, more precaution is necessary, as in a perfectly tight room fatal consequences frequently ensue from the use of the oxygen of

the air in supporting the combustion of the coal. No coal of any kind, should ever be burned in a room not provided with a proper passage for the escape of the vitiated air, and the renewal of the atmosphere of the apartment, by the introduction of that which is pure.

The idea that a room can be too tight, either for a fire place or stove, in which wood is burned, is absurd; the temperature of such a room may be raised too high, and in properly finished rooms it frequently is so; but that proves nothing, except that fuel has been wasted, and more heat produced than was necessary for the purpose required.

To have a winter residence in this climate comfortable, our dwellings should be constructed with particular reference to that subject. The large airy rooms open to the external air, so requisite in summer, are not at all suitable in winter, and the expenses of most householders are materially increased by inattention in this respect. Show should always be compelled to give way to health and comfort; and these should, if possible, always be combined with convenience and economy. The rooms to be occupied by the family should be on the least exposed part of the dwelling, and in no case should the doors open directly into the external air. Proper halls and entries assist most materially in the exclusion of winter's blasts.

If a fire-place is used for warming the room, it should be so constructed as to give out as much of the heat as possible into the apartment. To do this the fire-place must be shallow, and in combining with such a one the draft necessary to prevent smoke, and at the same time not be so strong as to force the heated air of the room too rapidly away, lies the great skill of the successful mason. In our opinion, an open fire is the most agreeable when properly managed, and we think there is about as much difference in the effect on the feelings, between an open fire and a stove, as there is between the former and that of the sun. We would give one hint to those who use fire-places, and have no wood houses, and that is, never to fill the corners within the jambs with green snowy wood for the purpose of drying it. Much of the heat thrown into an apartment is reflected from the back and jambs, and this heat is very unprofitably employed in seasoning green wood, or melting snow. Better, where such wood must be used, to put a stick or two at a time on to a lively burning fire, and enjoy an equal temperature, than half freeze while the wood is warming, and then be as effectually roasted while it is burning.

People who use stoves, in close rooms, in most cases live in a temperature much higher than they apprehend, which is probably one great reason why such fires are in general considered less healthy than open ones. Observation has convinced us that this difference between the heat of a room with a stove, and one with an open fire, is not, on an average, less than six or eight degrees. In the matter of a fire, seeing is believing. Where a stove is used, a thermometer is absolutely essential; for the man who comes from the open air into a room heated to 75 or 80, is not satisfied without an additional stick in the stove.

But whatever may be the nature of the apparatus used for heating a room, whether a stove or a fire-place, let no one dream of a proper temperature, if he intends using green wood. What a black account will be presented to that man for settlement, who shall be called upon to answer for the weak eyes and baconed complexion of his children, and the maledictions of his spouse, occasioned by unseasoned wood. Comfort and economy, domestic quiet and a happy family, and green wood, cannot exist together.

G.

THE EARLIEST PASSAGE THROUGH THE DISMAL SWAMP.

Extract from the *Journal* of Col. William Byrd, of Westover, while acting as one of the commissioners to survey and fix the line between Virginia and North Carolina, in 1728.

1728, March 13. Early this morning our chaplain repaired to us with the men we had left at Mr. Wilson's. We had sent for them the evening before, to relieve those who had the labor oar from Coratuck Inlet. But to our great surprise, they petitioned not to be relieved, hoping to gain immortal reputation by being the first of mankind that ventured through the great Dismal. But the rest being equally ambitious of the same honor, it was but fair to decide their pretensions by lot. After Fortune had declared herself, those which she had excluded, offered money to the happy persons, to go in their stead. But Hercules would have as soon sold the glory of cleansing the Augean Stables, which was pretty near the same sort of work.

No sooner was the controversy at an end, but we sent those unfortunate fellows back to their quarters, whom chance had condemned to remain upon firm land, and sleep in a whole skin. In the mean while the surveyors carried the line 3 miles, which was no contemptible day's work, considering how cruelly they were entangled with briers and gall bushes. The leaf of this last shrub bespeaks it to be of the *alaternus* family.

Our work ended within a quarter of a mile of the Dismal abovementioned, where the ground began to be already full of sunken holes and slashes, which had here and there some few reeds growing in them.

'Tis hardly credible how little the bordering inhabitants were acquainted with this mighty swamp, notwithstanding they had lived their whole lives within smell of it. Yet, as great strangers as they were to it, they pretended to be very exact in their account of its dimensions, and were positive it could not be above 7 or 8 miles wide; but knew no more of the matter than stargazers know of the distance of the fixed stars. At the same time they were simple enough to amuse our men with idle stories of the lions, panthers, and alligators, they were like to encounter, in that dreadful place.

In short we saw plainly there was no intelligence of this *terra incognita* to be got, but from our own experience. For that reason, it was resolved to make the requisite dispositions to enter it the next morning. We allotted every one of the surveyors for this painful enterprise, with 12 men to attend them. Fewer than that could not be employed, in clearing the way, carrying the chain, marking the trees, and bearing the necessary bedding and provisions. Nor would the commissioners themselves have spared their persons on this occasion, but for fear of adding to the poor men's burthen, while they were certain they could add nothing to their resolution.

We quartered with our friend and fellow traveller, William Wilkins, who had been our faithful pilot to Coratuck, and lived about a mile from the place where the line ended. Every thing looked so very clean, and the furniture so neat, that we were tempted to lodge within doors. But the novelty of being shut up so close, quite spoiled our rest, nor did we breathe so free, by abundance, as when we lay in the open air.

13th.—Before nine of the clock this morning, the provisions, bedding, and other necessaries, were made up into packs, for the men to carry on their shoulders into the Dismal. They were victualed for 8 days at full allowance—no body doubting but that would be abundantly sufficient to carry them through that inhospitable place—nor indeed was it possible for the poor fellows to stagger under more. As it was, their loads weighed from 60 to 70 pounds, in just proportion to the strength of those who were to bear them.

'Twould have been unconsionable to have saddled them with burthens heavier than that, when they were to lug them through a filthy bog, which was hardly practicable with no burthen at all.

Besides this luggage at their backs, they were obliged to measure the distance, mark the trees, and clear the way for the surveyors every step they went. It was really a pleasure to see with how much cheerfulness they undertook, and with how much spirit they went through all this drudgery. For their greater safety, the commissioners took care to furnish them with Peruvian bark, rhubarb, and ipecacuana, in case they might happen in that wet journey to be taken with fevers or fluxes.

Although there was no need of example to inflame persons already so cheerful, yet to enter the people with the better grace, the author and two more of the commissioners accompanied them half a mile into the Dismal. The skirts of it were thinly planted with dwarf reeds, and gall-bushes; but when we got into the Dismal itself, we found the reeds grew there much taller and closer, and, to mend the matter, were so interlaced with bamboo briers, that there was no scuffling through them without the help of pioneers. At the same time we found the ground moist and trembling under our feet, like a quagmire—insomuch that it was an easy matter to run a ten-foot pole up to the head in it, without exerting any uncommon strength to do it.

Two of the men whose burthens were the least cumbersome, had orders to march before with their tomahawks, and clear the way, in order to make an opening for the surveyors. By their assistance we made a shift to push the line half a mile in 3 hours, and then reached a small piece of firm land about 100 yards wide, standing up above the rest like an island. Here the people were glad to lay down their loads, and take a little refreshment, while the happy man whose lot it was to carry the jug of rum, began already, like Æsop's bread-carrier, to find it to grow a good deal lighter.

After reposing about an hour, the commissioners recommended vigor and constancy to their fellow travellers, by whom they were answered with three cheerful huzzas, in token of obedience. This ceremony was no sooner over, but they took up their burthens, and attended the motion of the surveyors, who though they worked with all their might, could reach but one mile further, the same obstacles still attending them, which they had met with in the morning.

However small this distance may seem to such as are used to travel at their ease—yet our poor men, who were obliged to work with an unwieldy load at their backs, had reason to think it a long way; especially in a bog, where they had no firm footing, but every step made a deep impression, which was instantly filled with water. At the same time they were laboring with their hands to cut down the reeds, which were ten feet high, their legs were hampered with the briers. Besides, the weather happened to be warm, and the tallness of the reeds kept off every friendly breeze from coming to refresh them. And indeed it was a little provoking to hear the wind whistling among the branches of the white cedars, which grew here and there amongst the reeds, and at the same time not have the comfort to feel the least breath of it.

In the mean time the three commissioners returned out of the Dismal the same way they went in, and having joined their brethren, proceeded that night as far as Mr. Wilson's.

This worthy person lives within sight of the Dismal, in the skirts whereof his stocks range and maintain themselves all the winter, and yet he knew as little of it, as he did of *Terra Australis Incognita*. He told us a Canterbury tale of a North Briton, whose curiosity spurred him a long way into this great desart, as he calls it, near 20 years ago; but he having no compass, nor seeing the sun for several days together, wandered about till he was almost famished; but at last he bethought himself of a secret his countrymen make use of to pilot themselves in a dark day. He took a fat louse out of his collar, and exposed it to the open day, on a piece of white paper, which he brought along with him for his journal. The poor insect, having no eyelids, turned himself about till he found the darkest part of the heavens, and so made the best of his way to the north. By this direction he steered himself safe out, and gave such a frightful account of the monsters he saw, and the distresses he underwent, that no mortal since, has been hardy enough to go upon the like dangerous discovery.

15th.—The surveyors pursued their work with all diligence, but still found the soil of the Dismal so spongy, that the water oozed up into every footstep they took. To their sorrow too, they found the reeds and briers more firmly interwoven than they did the day before. But the greatest grievance was, from large cypresses which the wind had blown down, and heaped upon one another. On the limbs of most of them grew sharp snags pointing every way, like so many pikes, that required much pains and caution to avoid.

These trees being evergreens, and shooting their large tops very high, are easily overset by every gust of wind, because there is no firm earth to steady their roots. Thus many of them were laid prostrate, to the great encumbrance of the way. Such variety of difficulties made the business go on heavily, insomuch, that from morning till night, the line could advance no further than 1 mile and 31 poles. Never was rum, that cordial of life, found more necessary, than it was at this dirty place. It did not only recruit the people's

spirits, now almost jaded with fatigue, but served to correct the badness of the water, and at the same time to resist the malignity of the air. Whenever the men wanted to drink, which was very often, they had nothing more to do but to make a hole, and the water bubbled up in a moment. But it was far from being either clear or well tasted, and had besides a physical effect, from the tincture it received from the roots of the shrubs and trees that grow in the neighborhood.

While the surveyors were thus painfully employed, the commissioners discharged the long score they had with Mr. Wilson, for the men and horses which had been quartered upon him during our expedition to Coratuck. From thence we marched in good order along the east side of the Dismal, and passed the long bridge that lies over the South Branch of Elizabeth River. At the end of 18 miles we reached Timothy Ivy's plantation, where we pitched our tent for the first time, and were furnished with every thing the place afforded.

We perceived the happy effects of industry in this family, in which every one looked tidy and clean, and carried in their countenances the cheerful marks of plenty. We saw no drones there, which are but too common, alas! in that part of the world. Though, in truth, the distemper of laziness seizes the men oftener, much, than the women. These last spin, weave, and knit, all with their own hands, while their husbands, depending on the bounty of the climate, are slothful in every thing, but getting of children—and in that only instance, make themselves useful members of the infant colony.

There is but little wool in that province, though cotton grows very kindly, and so far south, is seldom nipped by the frost. The good women mix this with their wool for their outer garments, though for want of fulling, that kind of manufacture is open and slazy. Flax likewise thrives there extremely, being perhaps as fine as any in the world; and I question not, might with a little care and pains, be brought to rival that of Egypt; and yet the men are here so intolerably lazy, they seldom take the trouble to propagate it.

16th.--The line was this day carried one mile and an half, and 16 poles. The soil continued soft and miry, but fuller of trees, especially white cedar.* Many of these were thrown down, and piled in heaps, high enough for a good Muscovite fortification. The worst of it was, the poor fellows began to be troubled with fluxes, occasioned by bad water and moist lodging; but chewing of rhubarb kept that malady within bounds.

In the mean time the commissioners decamped early in the morning, and made a march of 25 miles, as far as Mr. Andrew Mead's, who lives upon Nansimond River. They were no sooner got under the shelter of that hospitable roof, but it began to rain hard, and continued so to do great part of the night. This gave them much pain for their friends in the Dismal, whose sufferings spoiled their taste for the good cheer, wherewith they were entertained themselves.

However, late that evening, these poor men had the fortune to come upon another *terra firma*, which was the luckier for them, because the lower ground, by the rain that fell, was made a fitter lodging for tadpoles than men.

In our journey we remarked that the north side of this great swamp, lies higher than either the east or the west, nor were the approaches to it so full of sunken grounds. We passed by no less than two Quaker meeting houses, one of which had an awkward ornament on the west end of it, that seemed to ape a steeple. I must own I expected no such piece of foppery from a sect of so much outward simplicity.

That persuasion prevails much in the lower end of Nansimond county, for want of ministers to pilot the people a decenter way to heaven.

The ill reputation of tobacco planted in those lower parishes, makes the clergy unwilling to accept of them, unless it be such, whose abilities are as mean as their pay. Thus whether the churches be quite void, or but indifferently filled, the quakers will have an opportunity of gaining proselytes.

'Tis a wonder no popish missionaries are sent from Maryland to labor in this neglected vineyard, who we know have zeal enough to traverse sea and land on the meritorious errand of making converts.

Nor is it less strange that some wolf in sheep's clothing arrives not from New England, to lead astray a flock that has no shepherd. People uninstructed in any religion, are ready to embrace the first that offers. 'Tis natural for helpless man to adore his maker in some form or other, and were there any exception to this rule, I should suspect it to be among the Hottentots of the Cape of Good Hope, and of North Carolina.

There fell a great deal of rain during the night, accompanied with a strong wind. The fellow-feeling we had for the poor Dismalites, on account of this unkind weather, rendered the down we laid upon, uneasy. We fancied them half drowned in their wet lodging, with the trees blowing down about their ears. These were the gloomy images our fears suggested, though it was so much uneasiness clear-gain. They happened to come off much better, by being luckily encamped on the dry piece of ground aforementioned.

17th.—They were, however, forced to keep the Sabbath, in spite of their teeth, contrary to the dispensation our good chaplain had given them. Indeed their short allowance of provision would have justified their making the best of their way, without distinction of days. 'Twas certainly a work both of necessity and self-preservation to save themselves from starving. Nevertheless, the hard rain had made every thing so thoroughly wet, that it was quite impossible to do any business. They therefore made a virtue of what they could not help, and contentedly rested in their dry situation.

Since the surveyors had entered the Dismal, they had laid eyes on no living creature: neither bird, nor beast, insect, nor reptile, came in view. Doubtless, the eternal shade that broods over this mighty bog, and hinders the sun-beams from blessing the ground, makes it an uncomfortable habitation for any thing that has life. Not so much as a Zealand frog could endure so agueish a situation.

It had one beauty, however, that delighted the eye, though at the expense of all the other senses: the moisture of the soil preserves a continual ver-

* Now called juniper.—Ed.

dure, and makes every plant an ever-green, but at the same time the foul damps ascend without ceasing, corrupt the air, and render it unfit for respiration. Not even a turkey-buzzard will venture to fly over it, no more than the Italian vultures will over the filthy Lake Avernus, or the birds in the Holy Land over the Salt Sea, where Sodom and Gomorrah formerly stood.

In these sad circumstances, the kindest thing we could do for our suffering friends, was to give them a place in the litany. Our chaplain for his part did his office, and rubbed us up with a seasonable sermon. This was quite a new thing to our brethren of North Carolina, who live in a climate where no clergyman can breathe, any more than snakes in Ireland.

For want of men in holy orders, both the members of the council, and justices of the peace are empowered by the laws of that country to marry all those who will not take one another's word. But for the ceremony of christening their children, they trust that to chance. If a parson come in their way, they will crave a cast of his office, as they call it, else they are content their offspring should remain as arrant pagans as themselves. They account it among their greatest advantages, that they are not priest-ridden; not remembering that the clergy is rarely guilty of bestriding such as have the misfortune to be poor.

One thing may be said for the inhabitants of that province, that they are not troubled with any religious fumes, and have the least superstition of any people living. They do not know Sunday from any other day, any more than Robinson Crusoe did, which would give them a great advantage, were they given to be industrious. But they have so many Sabbaths every week, that their disregard of the seventh day has no manner of cruelty in it, either to servants or cattle.

18th.—It was with some difficulty we could make our people quit the good cheer they met with at this house, so it was late before we took our departure; but to make us amends, our landlord was so good as to conduct us ten miles on our way, as far as the Cypress Swamp, which drains itself into the Dismal. Eight miles beyond that, we forded the waters of Coropeak, which tend the same way, as do many others on that side. In six miles more, we reached the plantation of Mr. Thomas Spight, a grandee of North Carolina. We found the good man upon his crutches, being crippled with the gout in both his knees.

Here we flattered ourselves we should by this time meet with good tidings of the surveyors, but had reckoned alas! without our host; on the contrary, we were told that the Dismal was at least thirty miles wide in that place. However, as nobody could say this on his own knowledge, we ordered guns to be fired, and a drum to be beaten; but received no answer, unless it was from that prating nymph, Echo, who like a loquacious wife, will always have the last word, and sometimes return three for one.

It was indeed no wonder our signal was not heard at that time by the people in the Dismal, because in truth they had not then penetrated one-third of their way. They had that morning fallen to work with great vigor, and finding the ground better than ordinary, drove on the line 2 miles and 38 poles. This was reckoned an Herculean day's work—and yet they would not have stopped there, had not an impenetrable cedar thicket checked their industry. Our landlord had seated himself on the borders of this Dismal, for the advantage of the green food his cattle find there all winter, and for the rooting that supports his hogs. This I own is some convenience to his purse, for which his whole family pay dear in their persons; for they are devoured by moschetoes all the summer, and have agues every spring and fall, which corrupt all the juices of their bodies, give them a cadaverous complexion, and besides, a lazy creeping habit, which they never get rid of.

19th.—We ordered several men to patrole on the edge of the Dismal, both towards the north and towards the south, and to fire guns at proper distances. This they performed very punctually, but could hear nothing in return, nor gain any sort of intelligence. In the mean time whole flocks of women and children flew hither to stare at us with as much curiosity, as if we had lately landed from Bantam, or Morocco.

Some borderers too had a great mind to know where the line would come out, being for the most part apprehensive lest their lands should be taken into Virginia. In that case they must have submitted to some sort of order and government; whereas, in North Carolina, every one does what seems best in his own eyes. There were some good women that brought their children to be baptized, but brought no capons along with them, to make the solemnity cheerful. In the mean time it was strange that none came to be married in such a multitude, if it had been only for the novelty of having their hands joined by one in holy orders: yet so it was, that though our chaplain christened above one hundred, he did not marry so much as one couple during the whole expedition. But marriage is reckoned a lay contract in Carolina, as I said before, and a country justice can tie the fatal knot there, as fast as an archbishop.

None of our visiters could however tell us any news of the surveyors, nor indeed was it possible any of them should at that time, they being still laboring in the midst of the Dismal. It seems they were able to carry the line this day no further than one mile and 51 poles—and that whole distance was through a miry cedar bog, where the ground trembled under their feet most frightfully. In many places too, their passage was retarded by a great number of fallen trees, that lay horsing upon one another.

Though many circumstances concurred to make this an unwholesome situation, yet the poor men had no time to be sick, nor can one conceive a more calamitous case than it would have been to be laid up in that uncomfortable quagmire. Never were patients more tractable, or willing to take physic, than these honest fellows; but it was from a dread of laying their bones in a bog, that would soon spew them up again. That consideration also put them upon more caution about their lodging.

They first covered the ground with square pieces of cypress bark, which, now in the spring, they could easily slip off the tree for that purpose. On this they spread their bedding—but unhappily the weight and warmth of their bodies made the water rise up betwixt the joints of the bark, to their great inconvenience. Thus they lay not only moist, but also exceedingly cold, because

their fires were continually going out. For no sooner was the trash upon the surface burnt away, but immediately the fire was extinguished by the moisture of the soil, insomuch that it was great part of the sentinel's business to rekindle it again in a fresh place every quarter of an hour. Nor could they indeed do their duty better, because cold was the only enemy they had to guard against in a miserable morass, where nothing can inhabit.

20th.—We could get no tidings yet of our brave adventurers, notwithstanding we despatched men to the likeliest stations to enquire after them. They were still scuffling in the mire, and could not possibly forward the line this whole day more than one mile and 64 chains. Every step of this day's work was through a cedar bog, where the trees were somewhat smaller, and grew more into a thicket.

It was now a great misfortune to the men to find their provisions grow less, as their labor grew greater. They were all forced to come to short allowance, and consequently to work hard without filling their bellies. Though this was very severe upon English stomachs, yet the people were so far from being discomfited at it, that they still kept up their good humor, and merrily told a young fellow in the company, who looked very plump and wholesome, that he must expect to go first to pot, if matters should come to extremity.

This was only said by way of jest, yet it made him thoughtful in earnest. However, for the present, he returned them a very civil answer, letting them know that, dead or alive, he should be glad to be useful to such worthy good friends. But after all, this humorous saying had one very good effect; for that younker, who before was a little inclined by his constitution to be lazy, grew on a sudden extremely industrious, that so there might be less occasion to carbonade him for the good of his fellow-travellers.

While our friends were thus embarrassed in the Dismal, the commissioners began to lie under great uneasiness for them. They knew very well their provisions must by this time begin to fall short, nor could they conceive any likely means of a supply. At this time of the year both cattle and hogs had forsaken the skirts of the Dismal, invited by the springing grass on the firm land. All our hopes were, that Providence would cause some wild game to fall in their way, or else direct them to a wholesome vegetable for subsistence. In short, they were haunted with so many frights on this occasion, that they were in truth more uneasy than the persons whose case they lamented.

We had several visitors from Edenton in the afternoon, that came with Mr. Gale, who had prudently left us at Coratuck to scuffle through that dirty country by ourselves. These gentlemen having good noses, had smelt out, at 30 miles distance, the precious liquor with which the liberality of our good friend, Mr. Mead, had just before supplied us. That generous person had judged very right, that we now had got out of the latitude of drink, proper for men in affliction, and therefore was so good as to send his cart laden with all sorts of refreshments, for which the commissioners returned him their thanks, and the chaplain his blessing.

21st.—The surveyors and their attendants began now in good earnest to be alarmed with apprehensions of famine, nor could they forbear looking with some sort of appetite upon a dog, that had been the faithful companion of their travels.

Their provisions were now near exhausted. They had this morning made the last distribution, that so each might husband his small pittance as he pleased. Now it was that the fresh colored young man began to tremble, every joint of him, having dreamed the night before that the Indians were about to barbecue him over live coals.

The prospect of famine determined the people, at last, with one consent, to abandon the line for the present, which advanced but slowly, and make the best of their way to firm land. Accordingly they set off very early, and by the help of the compass, which they carried along with them, steered a direct westerly course. They marched from morning till night, and computed their journey to amount to about 4 miles, which was a great way, considering the difficulties of the ground. It was all along a cedar swamp, so dirty and perplexed, that if they had not travelled for their lives, they could not have reached so far.

On their way they espied a turkey-buzzard, that flew prodigiously high to get above the noisome exhalations that ascend from this filthy place. This they were willing to understand as a good omen, according to the superstition of the ancients, who had great faith in the flight of vultures.

However, after all this tedious journey, they could yet discover no end of their toil, which made them very pensive, especially after they had eat the last morsel of their provisions. But to their unspeakable comfort, when all was hushed in the evening, they heard the cattle low, and the dogs bark very distinctly, which, to men in that distress, was more delightful music than Faustina or Farinelli could have made. In the mean time the commissioners could get no news of them from any of their visiters, who assembled from every point of the compass.

But the good landlord had visiters of another kind, while we were there; that is to say, some industrious masters of ships, that lay in Nansimond River. These worthy commanders came to bespeak tobacco from these parts, to make up their loadings, in contempt of the Virginia law, which positively forbad their taking in any made in North Carolina. Nor was this restraint at all unreasonable, because they have no law in Carolina either to mend the quality, or lessen the quantity of tobacco, or so much as to prevent the turning out of seconds*—all which cases have been provided against by the laws of Virginia. Wherefore, there can be no reason why the inhabitants of that province should have the same advantage of shipping their tobacco in our ports, when they will by no means submit to the same restrictions that we do.

22nd.—Our patrole happened not to go far enough to the northward this morning; if they had, the people in the Dismal might have heard the report of their guns. For this reason they returned without any tidings, which threw us into a great, though unnecessary perplexity. This was now the ninth day since they entered into that inhos-

* By "*seconds*" is meant the second growth of tobacco, made from the suckers, which spring up after the plant had matured, and been cut down.—Ed.

pitable swamp, and consequently we had reason to believe their provisions were quite spent.

We knew they worked hard, and therefore would eat heartily, so long as they had wherewithal to recruit their spirits, not imagining the swamp so wide as they found it. Had we been able to guess where the line would come out, we would have sent men to meet them with a fresh supply. But as we could know nothing of that, and as we had neither compass nor surveyor to guide a messenger on such an errand, we were unwilling to expose him to no purpose: therefore, all we were able to do for them in so great an extremity, was to recommend them to a merciful Providence.

However long we might think the time, yet we were cautious of shewing our uneasiness, for fear of mortifying our landlord. He had done his best for us, and therefore we were unwilling he should think us dissatisfied with our entertainment. In the midst of our concern, we were most agreeably surprised just after dinner, with the news that the Dismalites were all safe. These blessed tidings was brought us by Mr. Swan, the Carolina surveyor, who came to us in a very tattered condition.

After very short salutations, we got about him as if he had been a Hottentot, and began to inquire into his adventures. He gave us a detail of their uncomfortable voyage through the Dismal, and told us, particularly, they had pursued their journey early that morning, encouraged by the good omen of seeing the crows fly over their heads; that after an hour's march over very rotten ground, they on a sudden began to find themselves among tall pines that grew in the water, which, in many places, was knee-deep. This pine swamp, into which that of Coropeak drained itself, extended near a mile in breadth, and though it was exceedingly wet, yet was much harder at the bottom than the rest of the swamp: that about ten in the morning they recovered firm land, which they embraced with as much pleasure, as shipwrecked wretches do the shore.

After these honest adventurers had congratulated each others' deliverance, their first inquiry was for a good house, where they might satisfy the importunity of their stomachs. Their good genius directed them to Mr. Brinkley's, who dwells a little to the southward of the line. This man began immediately to be very inquisitive, but they declared they had no spirits to answer questions till after dinner.

"But pray gentlemen," said he, "answer me one question at least: what will you have for your dinner?" To which they replied, "No matter what, provided it be but enough." He kindly supplied their wants as soon as possible, and by the strength of that refreshment, they made a shift to come to us in the evening, to tell their own story. They all looked very thin, and as ragged as the Gibeonite ambassadors did in the days of yore. Our surveyors told us they had measured ten miles in the Dismal, and computed the distance they had marched since, to amount to about five more: so they made the whole breadth to be 15 miles in all.

23rd.—It was very reasonable that the surveyors, and the men who had been sharers in their fatigue, should now have a little rest. They were all, except one, in good health and good heart, blessed be God, notwithstanding the dreadful hardships they had gone through. It was really a pleasure to see the cheerfulness wherewith they received the order to prepare to re-enter the Dismal on the Monday following, in order to continue the line from the place where they had left off measuring, that so we might have the exact breadth of that dirty place. There were no more than two of them that could be persuaded to be relieved on this occasion, or suffer the other men to share the credit of that bold undertaking. Neither would these have suffered it, had not one of them been very lame, and the other much indisposed.

By the description the surveyors gave of the Dismal, we were convinced that nothing but the exceeding dry season we had been blessed with, could have made the passing of it practicable. It is the source of no less than five several rivers, which discharge themselves southward into Albemarle Sound, and of two that run northerly into Virginia. From thence, it is easy to imagine that the soil must be thoroughly soaked with water, or else there must be plentiful stores of it under ground, to supply so many rivers—especially since there is no lake, or any considerable body of that element to be seen on the surface. The rivers that head in it from Virginia, are the South Branch of Nansimond, and the West Branch of Elizabeth—and those from Carolina, are North-West River, North River, Pasquotank, Little River, and Perquimons.

There is one remarkable part of the Dismal lying to the south of the line, that has few or no trees growing on it, but contains a large tract of tall reeds; these being green all the year round, and waving with every wind, have procured it the name of the "Green Sea."

We are not yet acquainted with the precise extent of the Dismal. the whole having never been surveyed: but it may be computed at a medium to be about 30 miles long, and 10 miles broad, though where the line crossed it, it was completely 15 miles wide. But it seems to grow narrower towards the north, or at least does so in many places.† The exhalations, that continually rise from this vast body of mire and nastiness, infect the air for many miles round, and render it very unwholesome for the bordering inhabitants. It makes them liable to agues, pleurisies, and many other distempers that kill abundance of people, and make the rest look no better than ghosts. It would require a great sum of money to drain it; but the public treasure could not be better bestowed than to preserve the lives of his majesty's liege people, and at the same time render so great a tract of swamp very profitable, besides the advantage of making a channel to transport, by water carriage, goods from Albemarle Sound into Nansimond and Elizabeth rivers in Virginia.

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28th.—Our time passed heavily in our quarters, where we were quite cloyed with the Carolina felicity of having nothing to do. It was really more insupportable than the greatest fatigue, and made us even envy the drudgery of our friends in the Dismal: besides, though the men

† This supposition of the breadth of the swamp was greatly short of the truth. According to the latest map, it is more narrow where the line crossed than at any more northern part, until the termination is nearly reached.—Ed.

we had with us were kept in exact discipline, and behaved without reproach, yet our landlord began to be tired of them, fearing they would breed a famine in his family.

Indeed so many keen stomachs made great havoc amongst the beef and bacon which he had laid in for his summer provision, nor could he easily purchase more at that time of the year with the money we paid him—because people having no certain market, seldom provide any more of these commodities than will barely supply their own occasions. Besides, the weather was now grown too warm to lay in a fresh stock so late in the spring. These considerations abated somewhat of that cheerfulness with which he bid us welcome in the beginning, and made him think the time quite as long as we did, till the surveyors returned.

While we were thus all hands uneasy, we were comforted with the news that, this afternoon, the line was finished through the Dismal. The messenger told us it had been the hard work of three days, to measure the length of only 5 miles, and mark the trees as they passed along; and by the most exact survey, they found the breadth of the Dismal in this place, to be completely 15 miles.

How wide it may be in other parts, we can give no account; but believe it grows narrower towards the north. Possibly, towards Albemarle Sound it may be something broader, where so many rivers issue out of it. All we know for certain, is, that from the place where the line entered the Dismal, to where it came out, we found the road round that portion of it, which belongs to Virginia, to be about 65 miles. How great the distance may be from each of those points, round that part that falls within the bounds of Carolina, we had no certain information—though it is conjectured it cannot be so little as 30 miles: at which rate the whole circuit must be about an hundred. What a mass of mud and dirt is treasured up within this filthy circumference, and what a quantity of water must perpetually drain into it from the rising ground, that surrounds it on every side?

Without taking the exact level of the Dismal, we may be sure that it declines towards the places where the several rivers take their rise, in order to carrying off the constant supplies of water. Were it not for such discharges, the whole swamp would long since have been converted into a lake. On the other side, this declension must be very gentle, else it would be laid perfectly dry by so many continuous drains: whereas, on the contrary, the ground seems every where to be thoroughly drenched, even in the dryest season of the year.

The surveyors concluded this day's work with running 25 chains up into the firm land, where they waited farther orders from the commissioners.

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For the Farmers' Register.

THE DIFFERENCE OF CLIMATE BETWEEN THE EASTERN SIDE OF THE CONTINENT OF NORTH AMERICA AND EUROPE.

Review. *An Essay on the Climate of the United States*: 8 *vo. pp.* 44, 2*nd ed*: *Philadelphia*, 1833.

This pamphlet appears to have been originally published in 1809, and re-published in 1833, with the addition of an appendix containing several notes.

This essay is, as the title page informs us, an inquiry into the causes of the difference in climate between the eastern side of the continent of North America and Europe—the appendix being mainly occupied with a new solution of the question, why the temperature of western Europe, is higher than that of the eastern coasts of America in the same latitudes.

The author rejects the common notion that the temperature will be mitigated by clearing and cultivating the surface, and gives an instance; China, an empire so well cultivated, which is yet subject to extreme vicissitudes of heat and cold. He attributes the difference between the climate of the opposite shores of Europe and America, to the prevalence of the westerly winds. These winds, he says, blowing over the American continent, make the winter colder, and the summer warmer, in North America—while blowing over the Atlantic, they make the climate of Europe milder in summer and winter both—the same causes thus producing opposite effects in the two continents. The writer next investigates the cause of the prevalence of westerly winds, in an argument, elaborate, abstruse, and, perhaps, from the nature of the subject, somewhat vague and conjectural. He contends that the trade winds, impeded in their course by the American continent, return by a sort of eddy current in a westerly direction.

It must be confessed, that the nature of the winds is very obscure—"they blow where they list, and no man knoweth whence they come, nor whither they go." There are so many currents, and under-currents, and tides of air—so many changes by rarefaction and condensation—the revolutions of the earth, and of the sun, and the currents of the ocean—that it requires a despotic Æolus to reduce them to order and regulate their fury.

To solve the question of the higher temperature of the European countries of the west, than that of the eastern coasts of North America in the same latitude, the writer argues that the greater body of the northern Atlantic, must be to the south—where being exposed to the more vertical rays of the sun, the waters become heated—this heat is communicated to the atmosphere, and that the winds blowing from the west, over the Atlantic, impart a milder temperature to the western countries of Europe, than is enjoyed on the coasts of North America in the same latitudes—and that the gulf stream tends also to produce the same effect. To these speculations in abstract physical geography, succeed some observations of a more practical bearing. The essay, denies that there have been such vast changes in the climate of European countries, as have been insisted on by some writers, and the author concludes, that where trees and plants incapable of withstanding hard frosts are indigenous, we may infer that the climate is not a severe one.

He thinks that the clearing and cultivation of a country, instead of making the climate milder, may cause greater extremes of heat and cold; and hence, the increased backwardness of spring and lateness of autumn, observable in this country. In answer to the opinion, that clearing forests will cause the surface to become more dry, and consequently warmer—he says, that the air does not

become temperate, in proportion, as it becomes dry—because fluids are capable of being heated as well as solids, and the air of Europe is more moist than ours, and yet more mild.

He mentions, that in elevation and figure, the northern parts of Europe, such as the countries on the south border of the Baltic sea, resemble the south-eastern parts of the United States—while the countries to the south of Europe, and along the north border of the Mediterranean sea, resemble rather the mountainous districts of Pennsylvania, Virginia and the Carolinas.

"Having endeavored to prove that the severity of our climate, and that of the eastern shores of Asia, is owing to the prevalence of the westerly winds, and that the same cause produces an opposite effect on the western coasts of both continents; and having attempted to account for it by the currents of air which constantly move across the Atlantic and Pacific oceans, from east to west, within the tropics; I should here conclude this essay, were I not desirous that these speculations might be the means of inducing persons of better information and more leisure, to pursue the inquiry, and were I not persuaded, that conclusions might be drawn from these positions which would lead to useful results.

"Whether the physical or intellectual powers of the human race are affected by climate, has frequently been the subject of discussion among those who have directed their attention to questions of this nature; and whether our climate, being liable to greater extremes of heat and cold than that of Europe, operates favorably or otherwise on our faculties, are questions with which I do not pretend to be conversant, and which to any practical purpose it seems unnecessary to discuss. The United States, lying within the temperate zone, their climate, subject as it is to great variations, must on the whole, be classed among the temperate; and men of great endowments, both mental and corporeal have been born and reared in countries that are subject to greater cold, and in others, where the heat is more intense.

"What effect our climate has on animals, as compared with that of Europe, and how far our modes and arts of life, especially the most generally practised and most important of all arts, that of husbandry, are influenced by climate, how far by habit; which of these, brought by our ancestors from Europe and still followed by their posterity, ought to be abandoned as not suited to the vicissitudes of our seasons; and what benefits would accrue from adopting others at present unknown, or little practised among us; are topics of no little moment, and which hitherto have not been much attended to. Practical men seldom apply their thoughts to such subjects, and more seldom communicate them to the public; and it has happened, rather unfortunately, perhaps, that some eminent European writers, having erroneously taken it for granted, that our climate was not only colder, but more moist than that of Europe, and having drawn conclusions from that supposed fact unfavorable to this country, some of our most distinguished citizens, eager to detect error, and zealous for the honor of their country, not content with refuting these positions, have gone into the opposite extreme, and have contended that our climate was equally temperate with that of Europe, in the same latitudes; or if not so now, that it would gradually approach the same standard, as our forests should be cleared, and cultivation extended over the face of the country. Had it been admitted that our climate was less temperate, and the difference been traced to a permanent cause, instead of controverting an unquestionable fact, or looking for changes which are never to happen, I cannot but believe that many new improvements would have been struck out, and that various important branches of agriculture would have been established among us, that are at present unknown; of these, perhaps, the most important, is the culture of the vine. Could we substitute for our beverage the pure and wholesome juice of the grape, instead of the liquid poisons obtained by distillation, so fatal to the health and morals of the laborious part of the community, what a change would be effected in the face of our country? How many industrious families would be saved from ruin! The habit of drinking fermented liquors has prevailed from the earliest ages among the race of men from which we are descended; and though the abuse of them, like that of every other good, no doubt has been productive of evil, it can hardly be questioned that they have added more to the stock of human enjoyment, than they have taken from it. The use of ardent spirits, which was unknown among the ancients, has produced fewer benefits, and incalculably greater mischiefs. Drunkenness is a much more prevalent vice, and is much more fatal among those who are addicted to the use of distilled liquors, than those accustomed to the use of wine or beer.

"No one, at all acquainted with human nature, will ever expect that the people of this country, any more than the present inhabitants of Europe, will ever abandon the use of intoxicating drinks; and ardent spirits will be in general use among the mass of the community, until a substitute is found. That wine would in a great measure supplant them, need not be doubted, if it could be produced in our country (for it is idle to expect it from abroad) in sufficient plenty for general use."—pp. 26—29.

That "drunkenness is a much more prevalent vice, and is much more fatal among those who are addicted to the use of distilled liquors, than those accustomed to the use of wine or beer," is not a singular opinion, and to a certain degree, is no doubt well-founded; but that it must be taken with some restriction, will appear from the following quotations.

"On my return to Oran, the same day I was struck, though not for the first time, with proofs of the excessive inebriety of the French common soldiers."—*Campbell's letters from Algiers*, page 283.

"By all I can learn, there never was a time when drunkards did not abound in France. I do assure you, that in the course of passing between Paris and London, I have been more struck by drunkenness in the streets of the former, than of the latter."

"Now I take it, this word *grise*, contains the essence of the superiority of wine over whiskey. It means *fuddled*—a condition from which one recovers more readily, than from downright drunkenness, and of which the physical effects are not so injurious.

I believe the consequences of even total inebriety from wine, are not as bad as those which follow inebriety from whiskey and rum. But your real *amateur* here, is no more content with wine, than he is with us; he drinks a white brandy, that is pretty near the pure alcohol."

"The official reports, show ten thousand cases of females arrested for drunkenness in Paris, during the last year."—*Cooper's Switzerland.*

The essay proceeds to consider the culture of the vine—and the opinions expressed, though not such as we can entirely concur in, yet on this, as on all other points, well deserves the reader's attention. The main object of preparing these observations, was to present the passages of our author in which agricultural matters are introduced.

"It is much to be regretted, that the efforts made at

different periods, and in various parts of the country, to attain this object, have hitherto been so unsuccessful as to induce a very general belief that there is something in our soil or climate so unfriendly to the vine, that it can never be cultivated here with success. As to the former, we know that the finest wines of Europe are the produce of soils of various descriptions, extremely different from each other, and it cannot be doubted that we have the same varieties here. The difficulty, if there be one, independent of our want of experience, must, I think, be referred to climate. Possibly it is insurmountable in some parts of the country; but I am persuaded that there are large districts within the United States, in which the grape would find as genial a climate as in Europe. The want of success that has hitherto been experienced, I think may have happened by the selection of kinds not suited to our climate. The vine, as well as other fruits which have been long cultivated, runs into innumerable varieties; and every wine country in Europe has those which have been found suited to its climate, or in a succession of ages have become accommodated to it. In selecting varieties, two leading circumstances would seem to require attention; the first, that they should be able to stand the severity of our winter; and the second, that the grape should ripen at that season of the year best suited to the making of wine. If the vintage take place during the summer heats, the wine becomes acid by excessive fermentation; and on the other hand, a grape that does not attain its maturity some time before the usual period of the setting in of the frost, might often be overtaken by the winter, and a year's labor lost. Indeed, if in a climate more temperate than our own, we should find a grape that united these two requisites, it might still fail, when removed to a climate different in other respects from its own. Various kinds of wheat from the Mediterranean have been occasionally sown in this country, and though they resist the cold of our winter, and ripen at the same time with the ordinary kinds, they have generally yielded an imperfect grain. We ought, therefore, in choosing varieties of grapes, to look for them in those countries whose climate most nearly approaches that of the district where the experiment is intended to be made. In Italy, Spain, and Portugal, and perhaps the south of France, we should doubtless find grapes of different kinds that would not ripen too early in the season; but being none of them accustomed to the severity of a winter like ours, it is highly probable that from this cause, most, if not all of them, would fail here. The vines of Burgundy and Champagne cannot be expected to succeed, both on account of the severity of our winters, and because the grapes would ripen too early in the autumn;* and yet, perhaps, all the varieties of grapes on which experiments have been made, have come from these countries. If we ever succeed, I think it must be by bringing our vines from the interior of Germany, from Hungary, or perhaps from Switzerland, countries remote from the sea, and whose climate is not much unlike that of many parts of our own.

"It is a known fact, that as we advance from the sea-coast into the interior of the continent of Europe, from west to east, the winters grow colder and the summers warmer; and in consequence of this difference of climate, the vine is found to succeed in the more eastern and less temperate regions, much further to the north than on the sea-coast. The neighborhood of *Nantz*, for instance, a little to the north of latitude 47°, is the northern limit of the wine district of France, on the western coast; but as we go to the eastward, the cultivation of the vine extends further and further to the north, and on the banks of the Rhine excellent wines are produced, at least three degrees further north, and where the severity of the winter is much greater.*

"In Germany, the line extends still further north, into Saxony; and in Hungary the vintage of Tokay, the richest perhaps in the world, is gathered considerably to the north of latitude 48°. Were our vines brought from these countries to those parts of the United States most like them in climate, it seems highly probable that many of them would succeed.†

"With regard to the degrees of heat, a pretty accurate judgment might be formed by a comparison of thermometrical observations that have been made in both countries; and the period when the grapes would attain maturity here, might be calculated from the periods of harvest, and the fall of the leaf from deciduous trees that are common to both countries. If in any two districts, the one in Europe, the other in America, the wheat harvest is at the same season of the year, the fall of the leaf at the same period, and the extremes of cold and heat are nearly alike, it can be hardly doubted, that if wine is made in one of those countries, it might be produced from the same grape in the other.

"These rules are capable of very extensive application; and if they are correct, we might, without wasting years in uncertain experiments, calculate in the first instance, with a great degree of accuracy, whether any particular grape would be suited to our climate or not. Perhaps in the more southern parts of the United States it would be difficult to apply them, as it may happen that in all the wine countries of Europe, whose winters are equally severe, the harvest is gathered at a later period, and the autumn comes on sooner. Such, I am inclined to believe, is the case; indeed, I am persuaded that the great warmth of our summers is much more unfavorable to the cultivation of the vine, than the winter's cold; and, of course, that some of the more northerly districts are much more suited to it, than those furthest south. Wine, I believe, is never made within the tropics. In Europe, Indian corn is found to require a warmer climate than the vine,‡ and there are few, if any districts in this country, where some of the varieties of that grain will not come to perfection. Most probably the winter of a large portion of the eastern states would be found too severe for most kinds of the vine. Were I, upon conjecture, to fix upon a spot for an experiment, I should look for it in those parts of the United States least subject to the extremes of heat as well as cold. The country south of the lakes Erie and Ontario, and the mountainous district that separates the eastern waters from those that fall into the Mississippi, in Pennsylvania, Maryland, Virginia, and perhaps the Carolinas, probably would be found to offer the most favorable situations for this purpose; but this can be determined by experience alone. Perhaps the experiment has already been made, under the circumstances I have ventured to recommend, and without success; but I cannot learn that it has ever been done; and if, in the first instance, it should fail, it ought not to be given up as hopeless, until a great number of trials are made with different kinds of vines, such as are most esteemed in the countries from which they are brought, and are most likely to suit our climate.§

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* See Legaux's Table of Vegetation in Pennsylvania, compared with that of some of the most famous wine countries in Europe. M'Mahon's Gardener's Calendar, p. 480, extracted, I believe, from some periodical work.

* See Young's Travels in France, and his map of the climate of France, annexed to that work.

† Since the above was prepared for the press, I have seen in the National Intelligencer, an account of some attempts to cultivate Hungarian vines in Maryland, near Hagerstown, which are said to have succeeded.

‡ Young's map of the climate of France, in which the northern limit of the climate fit for the cultivation of maize is placed about two degrees further south, than that of vines; both of them extending from the coast to the interior, in a north-easterly direction.

§ Nullum genus vitium conserendum est nisi fama, nullum diutius conservandum nisi experimento probatum. Columella, l. xvi. iii. Sec. 2.

"It may be supposed that the improvement of our native grape would be a shorter and more certain process; but all the kinds I have met with, have such harsh and crude juices, that I apprehend they cannot be improved, so as to become equal to the cultivated grape, for ages. The wild crab-apple is understood to be the original stock of all the fine varieties of that fruit of which we are now in possession. Cultivation, no doubt, has done much in the course of thousands of years; but most probably the greatest improvement has been effected by repeated selections of the best accidental varieties from seed, until they have been brought to their present improved state. In as long a course of time, possibly sooner, the native grape might be brought to the same state of perfection; but as all our cultivated apples are from European stocks, and no improvement from the native crab has hitherto been effected, it seems reasonable to expect, that if we look for equal success with the vine, we must pursue the same course."—pp. 29—33.

Though twenty-seven years have elapsed since the first publication of the foregoing passage, during which many persons have attempted vine culture and wine making, but little success, in general, has yet been met with, and we are but little better informed as to the causes of failure. While allowing much weight to the opinion of our author, as to the agency of climate in causing these different results in Europe and the United States, we also think there is much more in the differences of soils, than he supposes. It is true that vines are cultivated, and wine made profitably, on soils of various kinds in Europe. But it is believed that the best vineyards of Europe are generally, if not universally, more or less calcareous—while the soils of the eastern slope of the United States, have been recently found to be almost entirely destitute of calcareous earth—and probably, not an acre, or a rood, of vineyard, has been made artificially calcareous.

The cultivation of rice is next remarked upon—a crop which has been since abandoned in Virginia.

"Among other objects of cultivation that might be introduced or extended among us, we may, perhaps, reckon rice. This most valuable grain, which yields a greater supply of food from a given extent of ground than any other, is found, like Indian corn, to require a greater degree and longer duration of heat, than is afforded by the climate of the more northern parts of Europe; and, unlike that plant, it does not run freely into varieties, or readily accommodate itself to short summers. On the sunken grounds of the Chesapeake and its tributary streams, and perhaps the Delaware, are large tracts, that in soil and situation are well fitted to the cultivation of this plant. That the heat of summer is sufficiently great, there can be no question; the only doubt is, whether its duration is long enough. The kind that is cultivated in Carolina, is found not to ripen sufficiently early; it is, however, far from improbable, that in other parts of the globe, varieties of this grain might be found that would attain maturity sooner. Rice is said to be cultivated extensively on the banks of the Po, at no great distance from its source; a climate, the medium temperature of which I should think not materially different from that of the lower country of Virginia and Maryland. It is also said to have been lately introduced into Hungary,* the climate of which probably approaches still nearer to that of those parts of the United States. Whether it is cultivated so far to the north in China, I have not learned; if it be, it can hardly be doubted, that it would succeed equally well in the same parallels of latitude in the maritime parts of the United States.

"The similarity of climate between the United States and those parts of China that are in the same latitudes, has long since been remarked; and there is certainly no part of Europe, whose climate so nearly resembles our own. Unfortunately, our intercourse with that country is limited to a single port, and that further south than any part of the United States. If a free communication is ever established between our country and the more northern districts of China, it may probably be the means of introducing among us many plants of great utility, and which, being transplanted from a climate so like our own, would at once become naturalized to it."—pp. 33, 34.

However similar the geographical situation of China to the United States—there is, in respect to the grain spoken of above, a striking difference—for we are informed by Malte-Brun, that rice is the principal object of cultivation in China, except places in the north-west, which are too cold and dry for this crop—which is, therefore, replaced by wheat—(see Malte-Brun's Geography—book 42, page 560, Article, *China*—) whereas, we know that the production of rice in the United States, is confined to very narrow limits, being hardly heard of out of South Carolina, and there restricted to certain peculiar localities.

Malte-Brun, on the page preceding the one just referred to, says, "the northern and western parts of China have a far colder climate than the countries of Europe, which are situated in the same parallel of latitude. The elevation of the land, and the snows with which, for the greater part of the year, the central mountains of Asia are covered, contribute to produce this difference of temperature."

"The extremes of heat and of cold are much greater at Pekin, than at Madrid, though the latitude is much the same; it freezes daily in December, January and February, and very often in March and November—the cold is often followed by excessive heat. At Pekin, there are, properly speaking, only two seasons, winter and summer. Calculating according to the observations of Father Amyot, the mean temperature of the greatest heat, is 121°; that of the greatest cold, 63° below zero; the medium heat of the year, 55°." This authority then, confirms the facts stated by the essayist—but does not attribute this extreme mutability of the climate, to the prevalence of the westerly winds. It is stated by Dr. Drake of Cincinnati, that the mean temperature of Philadelphia, is 53° 20′, which corresponds very nearly with that of Pekin. China produces, besides rice, which is the principal food of its vast population, wheat, cotton, sugar, indigo and tea, which last, however, prospers only between the parallels of 30° and 23°. Silk is also made in China—the silk-worms seeming to be indigenous in that country. China boasts also, the camphor tree—the paper mulberry—the tallow tree—*croton sebiferum*—the aloe, the heart of which sells for its weight in gold—and the useful bamboo—the lemon—three varieties of the orange—one of which, is of the size of a cherry—the Chinese chestnut—the banana—tamarind and guava. The Chinese pay little attention to making wine, though several provinces abound in grapes. Not far from Nanking, grows the red cotton, of which nankeen is made. The fibre is of a delicate pinkish orange, which it preserves, after it is spun and woven.

* Miller's Gardener's Dictionary, Martyn's edit. art. ORYZA.

If the productions of one country, resemble another, we may infer, that they enjoy the same climate—and *vice versa*, if a similarity of climate be established between two countries, we may infer, that the productions of one, may be raised in the other. Latitude is an uncertain criterion, for in South America, the traveller finds summer at the base, and winter on the summit of the Andes.

Can any reader of the Register, refer us to the best maps of climate—charts of vegetable production? And here I will suggest the propriety of establishing a botanical garden in Virginia—an institution worthy of the attention of the state.

After the last quoted passage, the essayist continues:

"On the other hand, a due attention to the effect of our climate on some plants brought from Europe, might, perhaps, induce us to abandon the cultivation of them in the more southern districts of the United States. The common oat is a grain little suited to a warm climate; accordingly it is hardly known as an object of husbandry in the more southern countries of Europe. In America, while the northern states and the mountainous districts of the south, yield a grain that well repays the labor of the husbandman, that which is produced in the flat country of the southern states, as has been remarked by an intelligent English traveller,* is so light, that it hardly seems to possess the principle of vegetation; yet still, for the want of a proper substitute, it is cultivated throughout that range of country, whether to advantage or not, is at least doubtful. In a country destitute of meadows, an oat crop may serve as a substitute for hay.

"These instances are put by way of example. An examination of this subject in detail, would be foreign from the object of this inquiry; but I hope these unconnected hints may induce persons of more ability, and better means of information, to go more largely into it.

"Agriculture, like other arts, must depend for its advancement on experiments; but when these experiments are conducted on just principles, and in conformity to a correct theory, the road to improvement may be much shortened, and the labor and expense of attempts that cannot be expected to succeed, will frequently be avoided.

"By a due attention to the rules I have mentioned, and others that will readily occur to a reflecting mind, I am persuaded there is hardly a tree or a plant which belongs to any part of the old continent within the temperate zones, that might not be naturalized in some parts of the United States, and that without the waste of time or labor in a succession of fruitless experiments.

"It may be thought, that as our climate is subject to greater extremes than that of Europe, the country is not capable of producing some plants that flourish there. This, no doubt, is true, as to a large portion of the United States, with respect to some trees and perennial plants; but those vegetables that are useful to man, are, the greater part of them, annual, and, for their production, I am inclined to think our climate has the advantage of the more temperate one of Europe. Indian corn, a grain second in utility only to wheat, if it be second, requires a degree of warmth, that in Europe is only found in the more southern regions. In every part of the United States, from north to south, it is cultivated with success.

"Cotton, a plant of such extensive use, which flourishes to so great a degree throughout nearly or quite one-half the extent of our country, is only known as an object of cultivation in some small districts in the southern parts of Europe.

* Mr. Strickland's communication to the Board of Agriculture.

"The near resemblance between the climate of the United States and China has been already mentioned; perhaps no two countries on the face of the globe are more alike in this respect. That climate certainly cannot be thought a bad one, which of all others has been found most favorable to human life, and the richest in vegetable productions."—pp. 34—36.

The respective advantages of climate of our Atlantic states, and western Europe, are summed up and compared in the following impressive manner:

"Unfavorable comparisons of the climate of the United States with that of the western countries of Europe, in regard to the greater extremes of heat and cold, and more frequent and sudden varieties of weather in the former, are often made by Europeans, and, in some respects, perhaps not wholly without foundation; but I doubt whether the balance of advantages, if it be really in favor of Europe, is so in any very considerable degree. Some countries in Europe itself are much more subject to these extremes than others, and yet the inhabitants of the former are not inferior to those of the latter in health, bodily strength, or longevity. As has been observed in this essay, the thermometer has a much wider range in the eastern parts of France than the western, yet I believe that the native inhabitants of Brittany and Poitou, have never been thought superior in corporeal or mental qualities to those of Burgundy and Champaigne. The winters of the south of Germany, especially the more eastern part, are much more severe, and the heat of the summer greater than on the Atlantic coast in the same latitudes, yet the inhabitants of the former are as robust and long-lived as those of other countries in Europe. The changes of temperature to which our climate is subject, are seldom, if ever so sudden, as most persons engaged in active life go through daily, without injury, in winter and summer, in exchanging the temperate warmth of an apartment, for the open air. Our domestic animals average fairly with those of Europe. With respect to vegetable life, it is true, that the greater cold of winter deprives us of various useful trees and perennial plants that flourish in more northern latitudes in Europe; but, on the other hand, the greater heat of summer enables us to cultivate with success many valuable annuals, that cannot be brought to maturity in the north or middle of Europe. The cotton plant and Indian corn, both of inestimable value, are cultivated on a large scale, and are an abundant source of wealth and comfort, the former throughout an extensive region, comprehending the greater part of the southern states, and the latter in the whole extent of our country.

"In one point of comparison, I think our climate has the advantage of that of the more northern and western parts of Europe. The westerly winds, which carry with them the mild temperature of the Atlantic, are loaded with its vapors; and while we enjoy bright skies, and a clear, elastic air, for the greater part of the year, those countries, for much longer and more frequent periods, are enveloped in fogs, or obscured by clouds. This state of weather is not wholly without its advantages, but, on the whole, the balance seems to me, in this respect, in our favor.

"There is, however, one aspect in which the climate of a considerable portion of the territory of the United States may, perhaps, appear less favorable to Europeans, than that of any very great extent of country in the more temperate parts of Europe. Flat countries, intersected with stagnant waters, or sluggish streams, in hot or temperate climates, are almost uniformly less healthy than high lands, through which the watercourses pass with greater rapidity; and the comparative unhealthiness goes on increasing, with the distance from the poles. The southern coasts of Europe, from the Pyrenees along the Atlantic shores of Spain and Portugal to Gibraltar, and from Gibraltar to the Bosphorus, are generally mountainous, while the more

northern countries bordering on the German sea, and on the southern shores of the Baltic, from Calais to St. Petersburgh, are uniformly low and level. If in the formation of these regions the northern had been mountainous, and the southern flat and intersected with sluggish waters, it seems highly probable that the southern would have been comparatively more unhealthy than they now are.

"The sea coast of the United States is generally hilly, from Maine to New York. Further south is a belt of level land, narrower at the north, but increasing in breadth towards the south, until it forms a great extent of country, comprehending the whole maritime part of the southern states, from Maryland to the western limits of Louisiana, to which may be added, the southern part of the basin of the Mississippi, and its tributary streams. In this tract of country, as extensive as some of the larger kingdoms of Europe, though there are many districts that are far from being very unhealthy, the climate in general is thought less favorable to the European races of men, than that of the northern states, or the hilly country in the same latitudes, between the Mississippi and the Atlantic. To what cause is it owing, that the soil of this great tract of country is mostly cultivated by slaves, the descendants of those formerly imported from the coast of Guinea? And how does it happen, that their number, in comparison with that of the whites, goes on in an increasing ratio from north to south? Does this proceed from moral or physical causes, or from both combined? That the former have contributed to the introduction of slaves from Africa into our southern country, seems unquestionable. The products of this region, the tobacco of Maryland, Virginia, and North Carolina, and the rice of South Carolina and Georgia, meeting a ready market and good prices in Europe, occasioned a great and increasing demand for labor, and in later times, the successful cultivation of cotton, which has now become by far the most considerable product for exportation in the United States, has added greatly to that demand. Further to the north, the chief products of agriculture being either unsuited to transportation by sea, or like those of Europe, they have been less sought after abroad. Is it owing to this diversity, that while African slaves were freely admitted into all the English colonies, very few were received in the northern, while they were readily bought up in all the southern maritime country, where, to this day, almost the whole field labor is performed by their descendants? Or is this diversity owing, in part, to the difference of climate I have referred to?"—pp. 42, 44.

How much more dignified and useful, for our distinguished professional men of Virginia, (and the supposed author of this essay is one of the most distinguished,) to occupy their leisure in lucubrations of this kind, than in party squabbles and political wrangling—the petty intrigues of elections, and the scurrilous animosity of newspapers.

From the Richmond Enquirer.

PROCEEDINGS OF THE STOCKHOLDERS OF THE JAMES RIVER AND KANAWHA COMPANY.

The second annual meeting of the James River and Kanawha Company, convened at the Capitol in Richmond, on Monday, the 12th instant, and was organized by the appointment of Judge Summers of Kanawha, as chairman.

The proceedings commenced with the reading of the second annual report of the president of the company to the stockholders, of which the following is a sketch.

The operations and conditions of the company are stated under eight different heads.

I. *Change of officers and engineers.*—On the 20th January last, Mr. Samuel Marx resigned his seat in the Board of Directors, and the vacancy was filled by the appointment of Mr. Charles Ellis, of Richmond. On the 23rd of the same month, Mr. Randolph Harrison, senr., resigned his seat, and his place was supplied by Mr. Thomas M. Bondurant, of Buckingham.

On the 20th of February, Judge Wright resigned the office of chief engineer, on the ground of inability, from advancing age and bodily infirmity, to perform the active duties on so extesive a line of improvement. Mr. Charles Ellett, jr. was appointed his successor. The board desiring to avail itself of Judge Wright's skill and experience. appointed him consulting engineer, with the stipulation that he should visit the work at least once every quarter.

Mr. Simon W. Wright, resigned the office of principal assistant engineer, on the 26th of March. Mr. Daniel Livermore, was at this period, the only principal assistant in the service of the company. The board, with a view to make adequate provision for the wants of the new line, and for the survey of the old canal, authorized the president and chief engineer to appoint four additional principal assistants, and to make suitable modifications of the three original principal sections in the first division of the canal. Three of the places were filled by the appointment of Wm. Beckwith, John Couty, and Thomas De Witt. The great demand for engineers in the United States, put it out of the power of the board, to fill the remaining place with a suitable person. In the month of May, Mr. Livermore, from indisposition, resigned his office, and as no suitable successor could be obtained, the corps was reduced to the three principal assistants. This rendered it necessary to defer the contemplated survey of the old canal, and to employ two of the three principal assistants on the sixty miles next above Maiden's Adventure, and the third, on the next twenty miles below Lynchburg; and to confide the intermediate forty miles of the new line of canal, to the resident engineers, operating under the immediate instructions of the chief engineer.

Additions were made to the number of resident engineers, and of first and second rod-men, as they were required for the preparation of the line for assessment of damages, and for laying out and superintending the construction of the work.

The corps of engineers now consist of one chief engineer, one consulting engineer, three principal assistants, eleven resident engineers, eight rod-men of the first grade, thirteen rod-men of the second grade, two draftsmen, and one surveyor. It is contemplated in the course of the winter, to make further additions to the corps; so that in the spring, it will consist of one chief engineer, one consulting engineer, five principal assistants, fourteen resident engineers, fourteen rod-men of the first grade, fourteen rod-men of the second grade, and two draftsmen.

II. *Conclusion of the location of the first division of the canal.*—At the last report, the parts of the line extending from Scottsville to the Seven Islands, and from Columbia to Maiden's Adventure—in all, forty-seven miles, remained to be definitely located. The operations on these parts of the line, were necessarily interrupted by the winter season, and another cause of delay arose

from the casual removal of the stakes, indicating the preliminary location. From Columbia to Maiden's Adventure, the line required almost entire re-location. These parts of the seventy-three miles advertised for contract, in the month of December, 1835, and not let, required frequent renewals of the stakes; thus giving rise to much labor and loss of time to the engineers. From these causes, the work of location was much protracted. On the 22nd July, the chief engineer announced that the line was in readiness for reception, and after examination by a committee of the directors, it was approved at the August meeting of the board.

In the location of the canal, a leading object with the board of directors was, to have it raised beyond the reach of danger from floods in the rivers; and with this view the freshet of 1814, the greatest since 1795, was selected as furnishing a proper standard for the elevation of the line. The freshet in June last, afforded satisfactory proof of the skill exhibited by the engineers in this part of the work. At Lynchburg and Warminster, and for some distance above and below those places, the freshet of June was somewhat higher than that of 1814; but at no point on this part of the line did the water of the river come within two feet of the top of the embankment. From Scottsville to Richmond, the June freshet was relatively lower; insomuch, that at Columbia and Cartersville, it was four feet below that of 1814; but the chief engineer has ascertained, that in this part of the line also, such a flood as that of 1814, would not have reached the level of the tow-path called for by the location, except at a point on the estate of Wm. Galt, in Fluvanna, and there the embankment will be raised so as to guard against the overflow of the waters in future time.

III. *Assessment of damages.*—The preparation of the line for assessment of damages, necessarily awaited the action of the legislature on the bill to allow an increased breadth of ground for the canal, and a change in the mode of assessment. This bill passed on the 19th of March, and measures were immediately adopted, with a view to the speedy execution of the law. Surveys were immediately commenced to prepare for assessment the seventy-three miles advertised for contract in December, and to complete the location, and prepare the remaining forty-seven miles of the first division of the line. To make the surveys, maps, and annexed descriptions, necessary for this purpose, required much time. On the 2nd of May, the Board of Public Works were informed that the part of the line, under contract, would be ready for assessment in June. That board having completed the appointment of assessors, were, on the 29th of May, notified that the necessary preparations for the assessment would be made by the middle of June, and were requested to communicate that fact to the assessors, and invite them to assemble at Lynchburg, on the 22d of that month. A full meeting of the assessors was defeated by several resignations in that body. Three of the assessors met at Lynchburg on the 22d of June, and being unwilling to enter on the discharge of their duties, in the absence of their colleagues, adjourned to meet at New Market, on the 6th of July. On the 7th of July, they formed a board, and commenced the performance of their duties. They proceeded as far as the mouth of Rockfish—and finding their view of the lands obstructed by the crops, and the season unfavorable to the discharge of their duties, they adjourned to meet in Lynchburg, on the 1st of October. During the recess of the board of assessors, the whole line was prepared for assessment. On the 4th of October, a full board having been formed, the assessors commenced their examination of the lands at the water-works above Lynchburg, and continuing it through the estates for one hundred and twenty miles, reached the end of the line at Maiden's Adventure, on the 1st of November. They then adjourned to Richmond, and completed their assessments on the 25th of November. The decision of the number of bridges to be allowed, was reserved to the committee of the board of directors; and they have allowed on the line from Lynchburg to Maiden's Adventure, 15 road bridges, 83 farm bridges, and 4 pivot boats.

The whole amount of assessments, including costs of serving notices, counsel fees, pay of assessors, &c. &c., is $162,488 48; which makes the cost per mile, $1354 05. In this sum, the cost of additional fences rendered necessary by the canal, is embraced, and it constitutes a heavy item of the account.

IV. *Amount of contracts, and progress of construction.*—The line from Maiden's Adventure to Lynchburg, was divided into 201 sections, each forming the subject of a separate contract—each contractor to take one or more contracts, as the parties might agree. The contracts on these sections, embrace the grubbing, excavation, embankment, puddling and external walling. The result of the whole lettings is, that of the 201 sections, 161, embracing all of the most heavy and difficult parts of the line, are at this time under contract, and that 40 sections, consisting of light and easy work, are still to be disposed of.

Of the masonry, 10 locks, 21 culverts, the Rivanna aqueduct, two lock houses, and the water-works' dam at Lynchburg, are under contract. Except the dam at Lynchburg, the dams are reserved to as late a day as possible, to lessen the period of interruption to the existing navigation upon the river.

The force employed upon the line of new canal, in the month of October, was 985 men, and 286 horses. In the month of November, it was 1,356 men, and 381 horses.

The work of excavation, &c. has been retarded by the great rise in the price of labor, the inadequate supply of contractors and other causes. Some of these causes have ceased to exist, and the effect of others is diminished. From present appearances, it is believed, that by the 1st of April, the whole of the remaining 40 sections will be under contract. Contracts for the masonry have been delayed, in part, by the same causes that delayed the execution of the excavation; but principally by the insufficient supply of stone-cutters and masons. These causes, it is believed, will, in great measure, be removed, and all the masonry be got under contract in the spring.

V. *Preparations for the works of art, and discovery of hydraulic cement on the line of the canal.*—Since the last report, the agent employed to examine quarries, has completed his exploration of the country, in the vicinity of the canal. The result is, the discovery of about 30 quarries of suitable stone, and conveniently located, between Maiden's Adventure and the Seven Islands. Be-

tween the Seven Islands and Tye River, the quantity is deficient for locks, except at the upper end. Between Tye River and Lynchburg, there is a competent supply. The defective parts of the line, can be supplied from quarries on the river. In no part of the line will the transportation be more than 16 miles, and that by water. On the Chesapeake and Ohio Canal, it is stated, that a large part of the stone used in the construction of locks was conveyed 32 miles.

The search for hydraulic lime was confided to Judge Kinsey of New Jersey, who was well recommended to the board as possessing the necessary skill and experience. He examined the country on the margin of the river from Rockfish, to the town of Covington. He found no hydraulic lime below the Blue Ridge; but above the Blue Ridge, he met with it at three points, viz: in the vicinity of the Natural Bridge, at Pattonsburg, and on the farm of William Allen, in Botetourt. It had been previously found on Mr. Edmondson's farm in Rockbridge, on the north branch of the river, and about seven miles above the head of the mountain canal. At Pattonsburg, Allen's, and Edmondson's, the lime is situated on the margin of the river. At the Natural Bridge, it is two or three miles distant. In all four places, it is abundant and of good quality. Its quality has been tested by experiments made by the agent and chief engineer; and the product of Edmondson's quarry has been subjected to chemical analysis by Professor Rogers.

The total cost of exploring the stone quarries and searching for water-proof lime, amounted to $2048 68. The policy of this expenditure is well justified by the tendency of the facts developed to lessen the cost of the masonry on the line.

In June, the board contracted with Messrs. Edmondson and Graham, to deliver 50,000 bushels of cement, at Edmondson's quarry, on the North River, at 25 cents per bushel. To this must be added the cost of the barrels, making the price 37½ cents at the landing, at the same time, the board contracted for 10,000 bushels of Rosendale cement, to be obtained from the State of New York. This was delivered on the bank of the basin, in Richmond, at 54 cents; making a difference at the points of delivery, of 17 cents in favor of the home article. Assuming the upward and downward freight to be the same, and the quantity used between Lynchburg and Maiden's Adventure to be 350,000, or 400,000 bushels, the saving to the company would be about $60,000. If the calculation be extended to embrace the entire line to Covington, the saving would not be less than $180,000.

With a view to hasten the works of art, and increase the supply of mechanics, the board has recently sent an agent to Scotland, to procure stone-cutters and masons from that country.

VI. *State and location of the old works.*—1st, *the Western Improvements and Kanawha River.*—These works were examined by the President and Mr. Caperton as a committee of the board in September. The road from Covington to the mouth of Big Sandy, together with the Guyandotte Turnpike, is 208 miles long. It had been dressed over in the course of the preceding season, and, as to ordinary repairs, was in excellent condition. In regard to *extraordinary* repairs, none were necessary from the falls to Guyandotte, except the bridges over Witcher's Creek, Mud River, and at Guyandotte, all of which required re-construction. The road from Covington to the falls, and the bridges thereon, required extraordinary repairs to a considerable extent.

In order to sustain and improve the road, the board at the commencement of the year, made liberal appropriations for the repair of bridges; and in addition thereto, authorized the annual expenditure of $6,000 for repairs and improvements for three years. The road was divided into six districts, and to each district was assigned a party of hands with the necessary tools and teams. The work has been vigorously prosecuted. The western division has been put in excellent condition, and much work has been done on the eastern division. The operations on this part of the line have been much retarded by the heavy rains and summer travel.

The height of the waters in the Kanawha River, has prevented effective operations there, during the past season. In the month of August, the hands were employed in preparing buoys, repairing the scraper-boats and cutting down timber, that hung over the stream; but early in September, they were discharged; there being no prospect of advantageous action for the residue of the season.

2nd. *The Blue Ridge Turnpike, the Blue Ridge Canal, and the dam and canal at Lynchburg.*—By the law authorizing the construction of the Blue Ridge Turnpike, this company was authorized to take the road when completed, by paying the amount expended, or transferring stock therefor. In January last, the board was informed that the road was completed, and had cost $9,258 80. They determined to take the road, and paid in scrip to the state on its new stock, 92 shares, and the residue of $58 80 in cash. A tariff of tolls was prescribed for the road, and it was put under the charge of the superintendent of the Blue Ridge Canal.

The Blue Ridge Canal was examined by the engineers at an early period of the year. On their report, the board concluded, that, with some increased repairs, it might answer the purposes of navigation, and its re-construction be delayed, until the new canal should reach that part of the line.

The flood in June, did material injury to this canal, and some damage to the works at Lynchburg. The damage at the mountain consisted in breaking the dams, sweeping away the bridge, and destroying between 700 and 800 yards of embankment. The loss at Lynchburg consisted in breaking the dam. This dam was insufficient, and would have been replaced by a new one, in the progress of the work. The board took immediate steps to repair the damage at Lynchburg and at the mountain. The expense of the repairs at the mountain was greatly increased, and the work delayed by the wetness of the season. The canal was opened for navigation within seven weeks after the arrival of the force sent to repair it.

The whole amount of expenditure in the mountain was $12,715 23, from which should be deducted $3,000, expended to adapt the work to the plan of the new improvement, leaving the real loss at the mountain $9,715 23. The real loss at Lynchburg, is $1,000, making in all $10,715 23.

3rd. *The lower canal from Maiden's Adventure to Richmond.*—This portion of the canal was so

located, that at some points it was liable to be submerged, and sustained some damage from the freshets in June and August. From the statement of Mr. Richard Sampson, a director residing on the canal, and charged with an inquiry into the subject, the total amount of damage, inclusive of $285 worth of timber swept off, was $735.

In the month of May, preparations were made for a radical alteration of the Beaver Dam Aqueduct. A portion of the company's force was employed until the latter part of the month of August in providing materials. From the difficulty expected in the execution of the work in the ensuing months, it was postponed for another season.

The adjustment of the claims of the millers, &c. has been postponed until a general system for the sale and supply of water can be adopted.

Arrangements have been made for the immediate increase of the lower level of the canal, with a view to improve the navigation, and supply the increased demand for water power. The dimensions of this portion of the canal, will be equivalent to a cross section of 80 feet at the top of the water line, and 8 feet deep. The expense of the work will be enhanced by the necessity of excavating the additional breadth to the level of the water, before the water is drawn off. From a calculation of the chief engineer, the water that may be disposed of from this line, at present prices, would yield to the company an annual revenue of $120,000.

The dimensions of the residue of the lower line will not exceed the usual dimensions of the new canal. The survey of this portion of the work has been delayed for want of a suitable engineer; but the survey will be made, and the work re-constructed as speedily as circumstances will permit. A considerable portion of this work must be executed by the hands of the company. To ensure a sufficient force, an agent has been sent to some of the German States to procure laborers.

VII. *Fiscal concerns.*—On the 1st December, 1835, there was on hand, in the Bank of Virginia, a balance of revenue from the old improvements, of $5,873 07

And a balance on account of new improvements, of 90,144 78

Total, $95,017 85

Three requisitions had been made on the stockholders, amounting to $160,000 00

Of which had been paid 98,560 00

Leaving a balance due of $61,440 00

In the year 1836, the receipts from capital stock, amounted to 344,368 88

To which, add balance on hand, on same account, at the commencement of the year, 90,144 78

Total, $434,513 66

Disbursements on account of new improvements, during the year, 229,348 92

Leaving on hand, on the 1st inst., a balance of capital paid in, and applicable to new improvements, of $205,164 74

Balance on hand from old improvements, after paying all charges thereon, 13,040 37

Total amount on hand, 218,205 11

In the year ending 30th November, 1836, five additional requisitions were made on the stockholders, making with the three preceding requisitions, 680,000 00

Of this sum, there were paid in prior to the 1st December instant, 442,672 00

Leaving due, 237,328 00

Two additional requisitions have been made on the stockholders, including the state, of $5 each, per share, payable on the 25th January, and 25th May, 1837.

The balance of $205,164 74, is subject to the immediate payment of the assessments, amounting to $158,656 50. Of the balance of $237,328 due from stockholders, $114,308 are due from individuals, and $123,020 from corporations—of which, $36,500 may be considered as payable promptly. The sum of $86,520 due from the city of Richmond, will not be paid until the determination of the suit now depending in the court of appeals, touching the validity of the subscription. This suit will probably be decided in January or February. The sum of $114,308 due from individuals, will no doubt be much reduced by remittances, for which the present season is favorable; but it may not be paid with sufficient certainty to prevent a failure of means to meet the engagements to contractors. The monthly payments to contractors through the winter, will be from $50,000 to $60,000. Authority to borrow such small sums as may be required to meet the contracts of the company, until the state's subscription shall be payable, was deemed necessary.

VIII. *Extension of the company's sphere of action and provisions amendatory of the act of incorporation.*—1st. The attention of the stockholders was called to the provisions in the charter of the Lynchburg and Tennessee Rail Road Company, giving this company a right, if they shall so elect, to construct a rail road from Richmond to Lynchburg.

2nd. The most expedient line of communication between the canal and tide-water, being found to pass through the Armory lot, belonging to the state, the location at that place, stands suspended until the pleasure of the legislature on the subject can be known.

3rd. The chief engineer having been requested to report upon the most advantageous mode of connection between the canal and tide-water, had proposed a ship canal between Manchester and Warwick, to be connected with the James River Line by means of a basin formed by a dam at the foot of the falls—a plan approved by Judge Wright, and ordered by the board of directors to be presented to the stockholders for their consideration. To carry it into execution, the grant (by legislative enactment,) to the company of additional powers, and the privilege of raising additional stock, would be necessary.

4th. The state of Maryland having within the last two years, authorized a subscription of eight millions of dollars, for the purpose of hastening her connection with the Ohio River, at the town of Wheeling, and the state of South Carolina, having in conjunction with other states on our south-

ern border, commenced another line of connection with the Ohio, terminating below the mouth of the Kanawha River, the question was presented, whether it would not be expedient and proper for the company to request, and the state to grant an additional subscription, payable in a convenient term of years, upon the condition that the amount thereof should be expended exclusively in the construction of the company's rail road from Covington to the falls of Kanawha—the work to be commenced immediately.

In conclusion, the president bore testimony to the good conduct, attention and zeal of the officers and agents of the company, and especially to the improving condition of the corps of engineers.

Accompanying the report, were sundry resolutions proposed, giving authority, under specified restrictions, to the president and directors, to borrow money on the credit of the company, and directing memorials to be presented to the legislature, praying for leave to locate the canal across the Armory lot—for the additional powers, and the right to raise the additional capital, necessary to the execution of the plan of connection between the canal and tide-water, proposed in the report of the chief engineer above alluded to—and for an additional subscription from the state, to be applied to the immediate construction of the rail road from Covington to the falls of Kanawha.

Along with the report were presented a number of documents referred to therein, among which, were a copy of the assessments between Lynchburg and Maiden's Adventure, with accurate maps, surveys and descriptions of the land condemned; a copy of the charter of the Lynchburg and Tennessee Rail Road Company; a copy of the chief engineer's report on the survey for a ship canal from Richmond to Warwick, with a chart of the survey; the secretary's financial statements, &c.

The report, having been read, was, on motion, referred to a committee, consisting of Messrs. Chapman Johnson, Charles Yancey, Samuel McDowell Reid, Andrew Beirne, John Rutherfoord, Fleming James, John Wills and Lewis Summers, with instructions to inquire and report the measures which they deemed proper to be adopted.

The following preamble and resolutions submitted by Dr. Brockenbrough, were, on his motion, referred to the same committee, viz:

"Whereas, by the charter of the Lynchburg and Tennessee Rail Road Company, passed on the 11th March, 1836, it is made lawful for the James River and Kanawha Company, to construct a rail road from Richmond to Lynchburg, whenever the said rail road company "shall have commenced the construction of their road, pursuant to the provisions of the said charter;"—and, whereas, the said rail road company have not yet been organized—

"1. *Resolved by the stockholders of the James River and Kanawha Company*, That they now elect to construct said road from Richmond to Lynchburg, whenever the said Lynchburg and Tennessee Rail Road shall have been commenced.

"2. *Resolved*, That whenever the said Lynchburg and Tennessee Rail Road Company shall have commenced the construction of their rail road, the president and directors of the James River and Kanawha Company, be directed to open books of subscription for the purpose of raising the stock necessary to construct the said road from Richmond to Lynchburg, and that the necessary steps be taken to commence said road, whenever there is sufficient amount of stock taken to justify it.

"3. *Resolved*, That with the permission of the legislature, the company, in locating said road, will take such route to Lynchburg, after passing Willis' River, as may be deemed most practicable, on a complete survey of the different routes proposed, and an examination of the advantages and disadvantages of each."

The meeting then adjourned till 5 o'clock, P. M. on the next day, at the same place.

Tuesday, 13th December.

The meeting convened agreeably to adjournment; but on being informed that the committee above mentioned were not ready to report, adjourned till 5 o'clock, P. M. on the next day, at the same place.

Wednesday, 14th December.

The meeting having convened agreeably to adjournment, and called Mr. Wills to the Chair, the committee above mentioned, made a report, proposing for adoption the following resolutions, viz:

1. *Resolved*, That until the next annual meeting of the stockholders, the president and directors shall have authority to borrow money on the credit of the company, so far as they may deem it necessary to meet the engagements, and maintain the credit of the company; provided, that no loan or loans, negotiated under the authority of this resolution, shall severally, or in the aggregate, at any time, exceed the amount due and in arrear, from delinquent stockholders, upon requisitions previously made; and that no such loan shall be made payable after the 1st day of October next.

2. *Resolved*, That a committee of three be appointed with instructions to present to the general assembly, now in session, a suitable memorial, asking a modification of the charter of the company, in the following particulars, or in such of them, as to the wisdom of the legislature may seem expedient:

1st. Authorizing the location of the company's canal, through the lot of ground belonging to the state, on which the public armory stands, on such terms as may be deemed proper.

2nd. Granting to the company such additional powers, and authorizing them to raise such additional capital as may be necessary to the execution of the plan of connection between the tide-water and the canal, set forth in the chief engineer's report, communicated to the present meeting of the stockholders.

3rd. Making an additional subscription on behalf of the state to the stock of the company, to be applied to the immediate construction of the rail road from Covington to the western termination thereof.

4th. Authorizing the company in locating the rail road between Richmond and Lynchburg, after passing Willis's River, to take such route to Lynchburg, as they may deem best; provided, that if the main line of the road shall not pass by Scottsville, a lateral rail road shall be constructed connecting Scottsville with the main line.

5th. Authorizing the company to proceed in a summary way, by motion in court on ten days'

notice, or by warrant before a justice of the peace, for sums not exceeding twenty dollars, to recover from delinquent stockholders the amount due from them to the company, and in arrear, upon requisitions regularly made, with legal interest thereon, from the time when such arrears respectively shall have fallen due, till paid, and costs—provided, however, that no such proceeding shall be had against any delinquent residing within the commonwealth, until thirty days' notice shall have been given, by advertisement stuck up at the door of the court-house of his county or corporation, on some court day. This authority to be used at the discretion of the company, either before or after they shall have sold the stock of the delinquent.

6th. Making such provisions as the president and directors of the company may recommend for more effectually collecting the tolls on the Kanawha River and the company's roads, and for regulating the tolls on those roads.

3. *Resolved*, That the president and directors be requested to cause the necessary examinations to be made, for ascertaining at what point below the falls of the Kanawha it will be most advantageous to connect the rail road with the navigation of that river; and that they be further requested to combine with their report to a future meeting of the stockholders, the considerations upon which the opinion of the board may be founded.

The Committee embraced in their report the two first resolutions offered by Dr. Brockenbrough and referred to them.

The resolutions, and members of resolutions, reported by the committee, were taken up separately in succession, and adopted—some of them after discussion, and the fifth member of the second resolution, after an unsuccessful motion for its amendment.

Messrs. Chapman Johnson, Richard Anderson and John H. Cocke, were appointed to constitute the committee called for by the second resolution above adopted.

The committee then proceeded to the election of officers for the ensuing year; whereupon, Joseph C. Cabell, Esq. was unanimously re-elected President, and Messrs. Sidney S. Baxter, Richard Sampson, John H. Cocke, John Early, Hugh Caperton, Charles Ellis and Thomas M. Bondurant, directors.

The following gentlemen were appointed a standing committee to examine the books, papers, finances, &c. of the company, viz: John Rutherfoord, Fleming James, Lewis Webb, Robert Gwathmey, Nicholas Mills, Francis B. Deane, jr. and David Anderson, jr.

The Secretary's salary was raised to $1750.

The meeting then adjourned *sine die*.

From the Rritish Quarterly Journal of Agriculture.

EXTRACTS FROM A BIOGRAPHICAL MEMOIR OF SIR JOHN SINCLAIR.

[Continued from No. 3.]

In an essay like the present, we cannot overlook Sir John Sinclair's exertions to bring into public use the great discoveries in the art of draining land, made by Mr. Joseph Elkington, a Warwickshire farmer. Yet, although this system originated with that singular person, he was, in a great measure, unable to give to the world any very connected or distinct account of it; and, to obviate the difficulties arising from that circumstance, Sir John recommended Mr. John Johnstone, an intelligent land-surveyor, to the attention of the Board of Agriculture, as a gentleman amply qualified, not only to take plans of his different operations, but to give explanations of them.

Mr. Johnstone was accordingly nominated by the board, to accompany Mr. Elkington on a survey of the different drainages he had accomplished in several of the English counties, in order that a proper report might be drawn up of the principles on which his operations were founded, as well as practical details of the mode in which these were executed. The result was the publication of a systematic treatise on the theory and practice of draining land, which has become of standard influence on the subject of which it treats, and of which three editions have appeared—the first in 1797, the second in 1801, and the third last year, revised and enriched with so many valuable additions as almost to render it a new work.* In this way a complete account of Elkington's system was communicated to the public, and thousands enabled to put it into practice, who, for want of proper information, might long have remained ignorant alike of its principles, or their importance. To the credit of Sir John Sinclair it should also be told, that when, in 1799, the private affairs of Mr. Elkington had fallen into disorder, he endeavored to procure for him a parliamentary grant of £1000, in consideration of the benefits which his discoveries had conferred on agriculture. In this, after some exertion, he succeeded, and was in a great means the instrument of relieving the distresses of that ingenious and useful man.

It should also be remembered, that it was at the suggestion of Sir John, that the once overpraised, but now as much undervalued Dr. Darwin, the author of the Zoonomia, Botanic Garden, and Temple of Nature, was induced to undertake a work on practical agriculture. Nor can it be denied that the Phytologia, or Philosophy of Agriculture and Gardening—although, like the lectures of Sir Humphry Davy, of too abstract a description to be of general practical adaptation, abounds with useful observations and ingenious hints, whereof the recommendation of bone-dust as a manure should not be overlooked.† It was dedi-

* The reader is particularly recommended to the perusal of Mr. Johstone's work in its improved state, as being the best and most complete work on the subject of draining, which has been yet given to the world. For a more detailed opinion on this subject, we need only refer to the Number of this Journal for September last, in which an attempt has been made to lay its merits before the public.

In a letter to Charles Gordon, Esq., Secretary to the Highland and Agricultural Society, dated January 10, 1835, Sir John Sinclair says, "I am very glad that Mr. John Johnstone, land-surveyor, has published another edition of his treatise on draining land. It is by far the best work on that subject that has ever been printed, and does great credit to the author's talents, and extensive knowledge of the subject. I hope, therefore, that the society will take copies of it, and will recommend it in the strongest manner to the attention, not only of its own members, but also to those socities at home and abroad with whom it is in correspondence."

† The first notice of the employment of bones as a manure was made in Dr. Hunter's Georgical Essays

cated to Sir John in the following handsome terms:—"To Sir John Sinclair, President of the Board of Agriculture, by whose unremitted exertions such important improvements have been accomplished in the cultivation of the earth—that great source of life and felicity! This work, which was begun by his instigation, and forwarded by his encouragement, is dedicated with true respect, by his much obliged and obedient servant."*

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Sir John Sinclair thought, and with great propriety, that it might be set down as a maxim in literature, that "knowledge, previous to its being brought into a condensed state, may be compared to a small portion of gold, dispersed throughout a great quantity of ore. In that rude condition, the strongest man cannot sustain its weight, nor convey it to a distance; but when the pure metal is separated from the dross, a child may carry it without difficulty." Acting on this principle, he reduced the bulk of the Code of Health and Longevity, as we have just said, from four volumes to one, by condensing its details, and selecting its most valuable materials; and he then proceeded in the same way with the General Reports and the Statistical Account. In his view of the importance, nay necessity, of condensation, regarding art and science, implying by condensation the retaining only the more important facts and observations, and passing over those which either are of minor value, or are no longer useful, Sir John is ably borne out by Mr. Mill, the historian of India, who remarks, in his preface to that work, "that as no fact is more certain, so none is of more importance, in the science of human nature, than this—that the powers of observation, in every individual, are exceedingly limited; and that it is only by combining the observations of a number of individuals (or, in other words, forming codes regarding each important branch of science,) that a competent knowledge of any extensive subject can ever be acquired."

Proceeding in this spirit, Sir John set himself to digest the most valuable materials which had been given to the world on the subject of Agriculture, into one comprehensive volume. The English County Reports had been published in forty-seven octavo volumes, and those of Scotland amounted to thirty more. Seven volumes of communications, besides a number of other works on specific subjects, had also been published by the board. From these, and from the modern standard works on particular branches of the art, he picked out all the most valuable practical information, and where any topic appeared defective, he made every exertion to render it more perfect, by associating with experienced farmers, surveying their farms, and witnessing their most important operations on the spot. Thus armed, Sir John drew up his Code of Agriculture, the first edition of which was published in 1819. Three editions of it have been since given to the public of this country, besides another in America. It was also translated into the French, German, and Danish languages.

Long previous to this, however, it should be mentioned, that, in a letter to Sir John, Sir Joseph Banks had stated, "that an account of the systems of husbandry adopted in the more improved districts in Scotland, would be of the greatest advantage to the agricultural interests of the United Kingdom; and that it was incumbent upon a native of Scotlaad, while presiding at the Board of Agriculture, and possessing all the means of information which that situation afforded, to undertake the task. In objection, Sir John argued, that the labor of accomplishing such a task would be very great—that it would be extremely difficult to obtain the necessary information—and that it would afford an opportunity for cavillers to attack the board on the grounds of its promulgating doctrines which, if acted on, might prove ruinous to many farmers. But all obstacles vanished, when Sir John further urged, that agriculture has derived, is deriving, and will derive, more benefit from Scottish industry and skill, than has been accumulated since the days when Adam first wielded the spade." This occurred in 1809, but it was not till March 1812, that the whole mass of materials had been brought together. To do all justice to an undertaking so important, Sir John visited, in person, all those districts which were most celebrated for the cultivation both of strong and of light soils; and he afierwards circulated among the farmers whom he visited, a number of queries on rural subjects, requiring elucidation. By these means an immense mass of valuable matter was accumulated.

When, in 1793, the Board of Agriculture was constituted, the two great objects to which the attention of its members were primarily directed, were the general agricultural state of the country, and the means of improving that state. As the most effectual way of accomplishing this purpose, a number of qualified individuals were employed to draw up the district reports; and, as observed by a distinguished writer on husbandry, "in the course of little more than a year, the Board of Agriculture had printed a body of authentic facts respecting the agricultural and internal economy of this country, greater than was ever obtained by any other nation since the beginning of time." The collection of district reports having been accomplished, the board went a second time over the same ground, to have these reports consolidated into those of counties, and drawn up on a uniform and systematic plan.

This was the great object to which the attention of Sir John Sinclair was next directed, and in his address to the Board of Agriculture, on the 9th

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(vol. ii. p, 93,) and the discovery is attributed to Anthony St, Leger, Esq., a Yorkshire gentleman, so far back as 1766—another proof how long even the most important and valuable facts may be in arresting public attention. It was afterwards descanted on by Dr. Darwin, as we have just mentioned in the Phytologia (*vide* sect. 10,) and is briefly alluded to by Sir Humphry Davy in his lectures (page 252.) To the Doncaster Agricultural Association, however, belongs the merit of having collected the evidence on the subject, and of having decided on the great value of the discovery. This happened so recently as 1828, when the Association appointed a committee to make inquiries. The report was published by Ridgway, London, in 1829.

Sir John Sinclair immediately suggested, that the importation of bones should be encouraged by a public bounty, and that some allowance ought to be given to the captains of vessels, who brought home bones as ballast in their ships. For some years past the importation has become too profitable a speculation in commerce to require encouragement.

* *Vide* Phytologia, or the Philosophy of Agriculture and Gardening. 4to. London, 1800.

March 1813, he endeavored to explain the nature and advantages of making extensive inquiries the basis of condensed information. He then added, "that the power and prosperity of a country depend on the diffusion of useful knowledge, can hardly be questioned; and there is probably no art, in regard to which a variety of knowledge is of more essential importance, than in the art of agriculture. The extent of information necessary to bring it to any thing like perfection, is hardly to be credited. To preserve the fertility of the soil—to free it from superfluous moisture—to cultivate it to the greatest advantage—to raise its productions at the least expense—to procure the best instruments of husbandry—to select the stock likely to be the most profitable, to feed them in the most judicious manner, and to bring them to the most advantageous markets—to secure the harvest even in the most unpropitious seasons—to separate the grain from the straw with economy and success—and an endless variety of other particulars, require a degree of knowledge *to do them well*, of no common description."

From being in possession of the Statistical Account of Scotland, as well as of the County Reports, it was resolved to commence with that country, and Sir John, for the more entire completion of the task, associated with himself a committee of inspectors for revising the different great divisions of the work, consisting of Mr. Rennie of Phantassie, Mr. Robertson of Ladykirk, Mr. Low of Woodend, Mr. Walker of Wooden, Mr. Brown of Markle, Mr. Walker of Mellendean, Mr. Hunter of Glencarse, and the Rev. Charles Finlater of Newlands.

The grand divisions of this national work consisted of accounts of the geographical state and general circumstances of Scotland—of the landed property in Scotland—of buildings as connected with agriculture—and of the occupation of land in Scotland—together with dissertations on the implements of husbandry—on enclosing land, and the nature and advantages of fencing—and on the management of arable land.

The subsequent divisions of the work are devoted to the other branches of rural economy, after which a view is taken of the political economy of the nation, in which we are furnished with very interesting historical accounts of the various branches of our manufactures and commerce. In the volumes which constitute the appendix, a vast mine of information is opened up, regarding the civil and ecclesiastical divisions of Scotland.

On the appearance of the work, the Farming Club of Dalkeith, which consists of the principal agriculturists of the Lothians, Sir Joseph Banks, and upwards of fifty of the most eminent practical farmers in the kingdom, wrote to the author in terms of congratulation, and expressing their high estimate of its value.* As a work on the husbandry of Scotland could, however, only contain information applicable to districts similar in soil and climate, Sir John was then induced to turn himself to the great object of forming "a Code or Digest of Agriculture," on principles of universal application, and suited to all future times. In this he has amply succeeded; and had Sir John Sinclair bequeathed nothing to posterity save that work, his name must have ever been classed among the signal benefactors to the human race.

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We have already given, at some length, an account of the origin of that great national establishment the Board of Agriculture; and we have clearly seen, not only that the idea of such an institution originated with Sir John Sinclair, but that he was mainly, almost solely instrumental, in maturing its plans, and carrying these into execution, when formed. The labor and fatigue thus caused, would soon have worn out common zeal, more especially as it was attended, not with emolument, but great annual pecuniary loss. It is also admitted, on all hands, that an enthusiasm inferior to that which Sir John Sinclair evinced, in the cause of the national prosperity generally, and in that of its agriculture in particular, must have allowed the establishment, even after it had been put in operation, to have speedily fallen to pieces, so many ramifications of its interests had to be attended to, and so many individuals consulted. It will scarcely be credited, therefore, that, after Sir John had presided over the Board of Agriculture with so much honor to himself, and with so much benefit to the nation, for a period of five years, an attempt should have been made, and that successfully, to deprive him of the president's chair. We have no wish here to investigate into the causes of this transaction, or the ways and means by which it was effected. We fear that, throughout the business, Mr. Pitt did not act with his accustomed openness and generosity of disposition, although we can scarcely permit ourselves to suppose, that any political differences of opinion between himself and Sir John should ever have been allowed to actuate his conduct. It is true that Sir John differed with the celebrated minister in opinion, with regard to the trial of Warren Hastings, the Westminster scrutiny, and, we believe, also the Irish propositions; and it has also been surmised by some, that Mr. Pitt was not only a little jealous of his influence and popularity on some important national topics, but considered him too independent in his parliamentary votes. Be this as it may, there can be little doubt, that, through the exertions of Mr. Pitt, an opponent was started against Sir John; and that, through his influence, the opposition was a successful one. Most of the official members of the board were prevailed upon to attend the election, although they had never taken any part in its proceedings before. The Archbishop of York was an honorable exception, and, although applied to, he would not vote against Sir John. To the great mortification of the regular members, Lord Sommerville, who had been prevailed upon, although it appears very reluctantly, to come forward, was elected—but only by a majority of one. Sir John himself

* In an unpublished memorandum, Sir John states, that "the proprietors of land in the Lothians, and other improved districts of Scotland, reaped peculiar advantage from the attention that had been directed to the improvement and management of the soil, by the institution of the Board of Agriculture, an instance of which was given by the celebrated farmer Mr. Brown of Markle, in East Lothian, who, in a letter dated 5th January 1813, mentions, that a farm containing 330 Scotch acres of arable land, was just let for £2700 per annum, or at £8 2s. per Scotch, or £6 10s. per English acre, which he recollects in his early days did not pay above £300 per annum, while the occupiers were in a poor condition, and scarcely able to pay their landlord, at the usual term."

very kindly apologizes for this not very courteous intrusion on the part of his lordship, by telling us, that Lord Sommerville had been informed, that if he did not come forward, some other candidate would be found, or that the board would be abolished. No unkindly feeling was generated in the breast of the ex-president regarding his conduct in the matter, nor was it allowed to interfere with the friendly intercourse which had formerly subsisted between them.

To the credit and honor of the board, be it recorded, however, that the first of its acts, under the new president, was the passing of a vote of thanks to the old, for "his great attention to the duties of his office, and for his great zeal to promote the objects of the institution." A public acknowledgment of services thus publicly rendered, could not fail of being universally considered honorable alike to those who bestowed, and to him who received it; and it must have been soothing to the feelings of Sir John Sinclair, allowing that they might have been somewhat wounded on the occasion, if added to this general expression of the board, he received from the first Marquis of Lansdowne, from Warren Hastings, and from Bishop Watson, as well as from its treasurer and secretary, letters expressive of their wonder and indignation at the whole proceeding.

Eight years after this unbecoming and untoward transaction, Sir John Sinclair was again installed in the chair, from which he should have never been unseated; and he continued to hold the situation of president of the Board of Agriculture till 1813, when the vast expense which its management personally involved, and which had considerably impaired his private fortune, obliged him to resign. Lord Macclesfield was president when the board was finally dissolved, and its papers sent to the Tower of London—where they may still be seen heaped together in the Record Office, a huge mass of information, which it cost an immensity of human labor and research to accumulate, probably for ever lost to the world.

Having mentioned the exertions made by Sir John Sinclair to render the discoveries of Elkington of public utility, by having Mr. Johnstone appointed by the board to report on his system, as also to obtain the parliamentary grant for that individual, which rendered his old age comfortable, we must not omit those in behoof of Andrew Meikle, the inventor of the thrashing machine—unquestionably the most valuable implement introduced into the practice of husbandry during the last hundred years. At the age of ninety-two, he was still alive and in great poverty; and it at once occurred to Sir John, that this opprobrium should instantly be removed by the nobility and landed interest, whom his discoveries had so much benefited. Mr. Meikle having been born, and still residing in East Lothian, he addressed a letter to the Earl of Haddington, as Lord Lieutenant of the county, earnestly recommending the subject to his attention. A general meeting of the proprietors and farmers was accordingly held on the 26th December 1809, and the measure met with unanimous approbation. The sum of £1-500 was thus raised; and the family of the unpretending old man, whose invention has been of so much benefit to the world, was thus rescued from the necessities which must have otherwise encompassed them for ever. Sir John had also the pleasure of raising a sum of money for the family of Mr. Small, who distinguished himself by his improvement on the construction of the Scotch plough.*

For the Farmer's Register.

SOME OBSERVATIONS ON CLOSE ROOMS.

Ward's Fork, Charlotte.

In a former essay I said something of the inconvenience of dust. I shall here speak of, perhaps, a more disagreeable intruder—impure air. I have often wondered how people could live at all in the air of as close apartments as our chambers. The whole family is frequently seen crowded together in a small room breathing the same air until it will scarcely support the flame of a tallow candle, much less the lamp of life. In such airless holes, life languishes, health declines, the mind grows feeble and dispirited, and the complexion grows pale and sickly, and the poor nervous inhabitant becomes unfit for any part of domestic business, or for the social scene: and what is most remarkable, that there is a notion among some folks, who have certainly mistaken the thing, that a florid color is a mark of vulgarity. Look around you, and pray who are the people that carry the most of the ghostly visage and sallow complexions? Are they not the half-fed, half-clothed, and half-aired inhabitants of close cabins, cellar rooms, and factories, and prisons, which are mostly deprived of pure air, which reddens and invigorates the blood? How this prison-house complexion ever should have been admired, and thought genteel, I am at a loss to tell. 'Tis true, I have seen some well bred genteel people with this color, who have stewed themselves down to it in close hot rooms, under a notion that it adds to a desirable delicacy, and removes a masculine coarseness. But this is certainly a wide mistake.

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Nothing purifies and clears the skin as much as pure air and fresh spring water. Do you wish for a beautiful complexion? Use nature's paint. Do you wish to be sweet? Take your perfumes from her dressing box, and washes from her bottles. Do you wish to be fair? Inhale the pure air of the morning. Nothing beside can impart the delicate tints. No color has been so much celebrated by the poets as the clear white and red mingled. The white gotten from close rooms is a dull, not a clear white—not a fresh, but a sickly hue—not attracting, but forbidding. The perfect complexion is the red of the rose delicately blended with the white of the lilly. This is nature's best painting, and I will venture to say, excludes any idea of vulgarity. Some ladies, strange to tell, after having procured the pale color by confinement in close rooms, have been caught with artificial paint on their cheeks. This shows the secret preference to the rosy cheek. But here again, in this sort of flesh coloring, they miss their object: this is daubing, not painting. Nature is

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* For a very interesting biographical account of James Small, and of his improvements in making instruments of husbandry, *vide* General Report of Scotland, vol. iv. Appendix, p. 352-9.

the only painter in this case. She alone can mingle aright the delicate shades of the "human face divine."

Besides the unhealthiness of close rooms, it is certainly quite ungenteel to take into our lungs air breathed over and over again by others. We think it so to wash in the same water and drink out of the same cup; but to take into our lungs air many times expelled from our neighbors', seems more so.

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Another inconvenience of unventilated rooms is, the limbs of the farmer are so relaxed by sleeping in such, that it greatly indisposes him to quit his bed at an early hour to attend to his business. When people lived in more open houses, they were more active, industrious and energetic. When the morning light broke in at the cracks, they broke out at their doors. These men rose early to wear out their lands: I wish their sons may rise early enough to restore them. I really believe the amount of energy that one has in any given time, depends more upon the pure fresh air that he inhales in that time than on any thing else—and one's future success in life greatly depends on the quantity of pure air he breathes in early life. The destinies of families and nations are, I think, much influenced by the construction of their houses. It is hard for me to believe that many great or useful men ever came out of air-proof houses. Hardy raising, I think, is indispensable to success in agricultural pursuits. Men brought up in a delicate way have not the energy of grasshoppers. After the cock has crowed thrice, they are still soaking in bed. They shrink with horror at the approach of cold air. The room must be warmed by a log fire before they will venture to put on their breeches—and they must get two or three cups of strong coffee before they will venture to see about their stock if the weather is bad. And this indispensable attention to stock in bad weather is committed to whom? To an overseer who has no more concern for them than for those of the next neighbor. I have heard some of these love-sleep gentry exclaim on getting to bed, "blessed is the man that invented sleep." They might add more: "blessed is the man that invented overseers." For the idea of being relieved from the necessity of attending to business is far more grateful to their relaxed nerves than even sleep itself. You may talk about plaster of Paris, lime, marl, and stable manure, for exhausted soil—but all in vain—if there is not energy and industry, perseverance and firmness to apply them. It is physical energy and mental firmness, and they go together, that are wanting. It is not the want of ways and means, but the power of execution. The very name of a rail road, or steam boat, or a plaster mill, throw our men, with overseers and hot rooms, into fits of hypochondria. Much labor! too much labor! is the cry; and they shrink back from such mighty projects, saying "blessed is the man that invented sleep."

I. R.

CURE OF LOCK JAW.

Among the horses exhibited at the West Suffolk agricultural show, was a fine cart mare, the property of Colonel Rushbrook, which was some time since seized with locked jaw, and was perfectly cured by pouring cold water along the back from a watering pot, without intermission for a considerable time; the application being recommended by an eminent London veterinarian. This affection has been generally considered incurable.—*English paper.*

THE NECESSITY OF COLD ON SILK WORMS' EGGS BEFORE THEIR HATCHING.

To the Editor of the Farmers' Register.

Vicksburg, (Mi.) Nov. 29, 1836.

I perceive by an extract from a French author, in your No. 6, that it is considered an important desideratum to hatch the eggs of the silk worm the same year they are produced, so as to have a series of generations. Having paid but little attention to the business for several years, I had thought that the difficulty was long since overcome. I once raised a few from motives of curiosity, and wishing to have a second crop, like your French author, I tried animal heat, but to no purpose. In the following spring, the eggs hatched before the mulberry had put forth its leaves. The circumstance of their hatching at 70° in the spring after, withstanding the greater heat of the previous summer, induced me to reflect upon the subject. A little reflection convinced me that in their wild state, a series of generations must be produced in the same year—the last of which remains in the chrysalis state during the winter; that the eggs require to be chilled to a certain degree before they will hatch; that the night air, to which they are exposed in their wild state, is sufficient for the purpose. My curiosity having been fully gratified, I did not proceed to test the correctness of this idea: but if the night air is not sufficient, an artificial winter might easily be contrived—and the only wonder is, that so obvious a plan should never have been tried.

From the British Quarterly Journal of Agriculture.

SOME ACCOUNT OF FLEMISH HUSBANDRY.

By Alexander Thompson, Esq. Banchory House, Aberdeenshire.

I spent a few weeks, in the summer of 1835, in Belgium, and I then observed several agricultural practices which were new to me, and which appear worthy of consideration, if not of imitation, in our own country.

In various parts of Brabant, I saw, in all the various steps of its progress, a mode of bringing heath and moorland into cultivation, which, on inquiry, I found to have been long practised, and to a very great extent. The ground to be improved, generally not exceeding an acre at one time, and often much less, is planted with one year old seedling oaks, in rows one foot apart, and the same distance from plant to plant in the rows; these make annual shoots of at least twelve or fifteen inches with a proportional side growth. They are allowed to grow up untouched for five or six to eight or ten years, according to the progress they make. The annual fall of leaves enriches the soil, while the thick shade completely extirpates the heath and other wild plants. When the

soil is supposed to be sufficiently ameliorated, the young trees are grubbed up, the stems are made into faggots and sold for firewood, and the leaves and small branches are burned on the spot and the ashes carefully spread on the soil where they act as a very stimulating manure. The ground is then ploughed and sown with a corn crop—generally oats, a regular rotation of cropping ensues, and thus the land is permanently reclaimed.

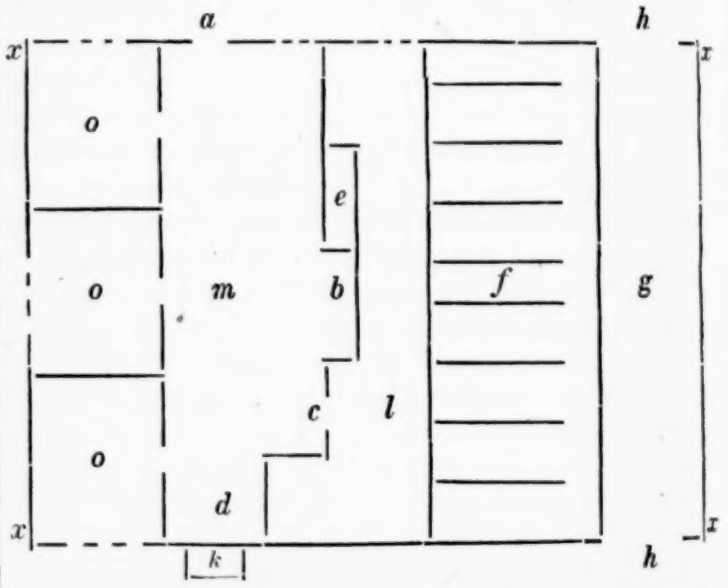
Those moors which I saw, looked very poor and unfertile. The heath was short and stunted, and where the soil was recently turned up, it looked as white as a newly limed field. In short, it seemed little better than pure sand, which, however, had the greasy feel peculiar to alluvial soils, and in some places there was a thin stratum of peat earth above the sand. The lately planted oaks looked exactly like nursery ground, and the older like very thick coppice, so that this mode of improving produces immediate beauty. A few of the trees of the outside rows are sometimes left to grow to timber, but too frequently the oaks are cut out to make room for willows and poplars, which afford a larger quantity of firewood. I could not get any distinct account of the expense of this mode of improvement; but, as firewood is very dear in Belgium, I should expect that the faggots sold would amply repay the price of the seedlings, and the expense of planting and grubbing them up. There is no other expense in the process, until the ploughing and sowing, which, of course, ought to be charged against the ensuing crop. I was informed that a large portion of what is now arable land in Brabant, was in the state of a barren moor, even within the memory of persons yet alive, and had been reclaimed in the manner now described.

There may be situations in Scotland far removed from supplies of manure where this process would succeed and pay. We all know the effect of larch plantations in extirpating heath, and producing good pasture, where little or none existed before.

The Belgian farmers are not contented with one good crop in the year; they contrive to have two from a considerable part of their land. Wheat and rye are sown in autumn; in February or March, carrot seeds are sown among the braird, and the best time for doing this is when the ground is covered with snow; when the snow melts, the seeds are carried down into the soil, and if there be no snow, the best time is during a heavy fall of rain. The carrots spring and grow under the grain. A wide toothed wooden harrow is drawn over the ground, which slightly stirs the soil and loosens the stubble. The latter is carefully pulled up with the hand and removed from the ground, and the carrots when necessary, are thinned. They grow rapidly after getting the ground to themselves, and produce a large supply of winter food. The objection which naturally occurs to this plan in any country, is, that it is too much for the soil to carry two crops at one time; but it must be noticed, that the corn crop draws its nourishment from the upper part of the soil, whilst the carrot roots pentrate much deeper and feed upon a lower stratum.

Turnips are sown after the cutting down of the grain crops, but the harvest is so early in Belgium that the stubble is ploughed in, and the turnip generally sown by the 15th or 20th July. All those I saw were broadcast. After corn, they also frequently sow spurry; a plant with us considered utterly unworthy of cultivation, but so much esteemed in Belgium that I found there is a law against exporting the seed.

The collection and preservation of manure is unquestionably the chief excellence of Belgian farming, and the subject on which we may derive most instruction from attending to these practices. When they have the means of procuring distillery refuse or any other liquid manure, they form small tanks for receiving it. These are built of brick, four or six together, about seven feet deep, and each division from six to ten feet long, and six or seven feet wide; when empty they are neatly whitewashed inside. I do not know why they are not rectangular, but I saw none which were so. All sorts of liquid manures are conveyed from the large towns by the rivers and canals to a considerable distance, and bring a large price. They are bestowed chiefly on the young brairds, or, as it was expressed to me, "the whole spring they are constantly watering their braird with liquid manure, driving carts, with barrels, across their fields in every direction, and showering it upon their young crops," that is, if they have a sufficient quantity of it, they go over all their corn crops repeatedly with it during spring. The effect of this must be very beneficial—but the farmer must and ought to depend principally on the produce of his own farm-yard for his manure, and it is here that the Belgian system is so admirable. The following sketch of the ordinary mode of arranging a house, will assist in understanding their mode of proceding.



a, House-door. *b*, Large fire place, *c*, Door to Cow-house. *d*, Part of Kitchen devoted to churning, &c. *e*, Tank for distillery grains: this does not always occur. *f*, Stalls for cattle, very slightly divided. *g*, Dungpit. *h h*, Doors of Dungpit, wide enough to admit a cart. *k*, Dog-wheel for churning. *l*, Cowhouse, *m*, Large apartment for cooking, eating and working. *o o o*, Sleeping apartments. *x x x x*, Outer walls of house. The barns, stables, &c. are generally detached. The large space over the rooms and under the roof is used for keeping hemp, flax, &c. until they are dressed. The width of the whole may be from 40 to 50 feet.

It will be seen that the dwelling-house and cow-house are contiguous. The kitchen or family room is a very large apartment, one end of it is appropriated to churning, &c., and on the side next the cow-house is a very large fire-place, or hearth, in one corner of which, will invariably be found a fire

and a large boiler over it. This is for preparing the liquid food for the cows, with which they are liberally supplied three times a day. It contains water, chaff, weeds of all sorts, nettles, &c. covered with a little rye, rape, or linseed meal, or mixed with distillery refuse. The butter-milk is also added and given back to the cows, and with so much liquid food, they are able to consume a great deal of straw in winter. Turnips and carrots seem to form but a small proportion of their food. In summer they have clover, and spurry in autumn when grown. A door adjoining the fireplace leads to the cow-house, and the liquid food is given in wooden troughs, kept clean and nice. Behind the cattle is the dungpit: this is excavated to the depth of six or eight feet, and is twelve or fourteen wide, into it they cast every sort of stuff; sweepings of roads, parings of ditches or banks, and dry earth. These being completely saturated with urine and mixed with droppings from the cattle, form admirable manure. Not being exposed, like an English straw-yard, to wind and rain, little or nothing is evaporated or lost. When the manure is required, it is taken out, and the pit again filled with earth, &c. It is of course not filled up to the level of the stalls, but space is left for the increase of the manure. The cattle are constantly in the house, except an hour or two in the morning in summer, and at noon in autumn, when they go to walk along the lanes. Field pasturing is unknown, and thus almost all the manure is deposited in the house, and even a large proportion of what falls out of doors is gathered up and collected in heaps by children. The quantity of manure thus collected is very great, and owing to the variety of their crops, the dungpits are emptied several times a year.

I think the Highland Society might with propriety offer a premium for experiments on the use of covered dungpits, and I have no doubt that if the practice were once introduced, the advantages would soon establish it universally. The Belgian cattle are certainly too much confined to the house, and part of their food seems more calculated to improve the dungpit than any thing else, and to this I attributed what appeared to me the inferior quality of all the products of the dairy; but this is a quite different question from the propriety of sheltering the manure, necessarily produced in a farm-yard, from the effects of the weather, whether it be sun, or wind, or rain.

The dogs in Belgium are obliged to take their share of the farm work, and relieve the dairy-maids from the labor of churning. A wheel is erected outside the house, and under a wooden cover, twelve to fourteen feet diameter, with a rim about fifteen inches broad. The dog is placed within the wheel, and moving forward, causes the wheel to go round exactly like a tread-mill, except that the dog is placed within, and the men outside the wheel. There are wooden teeth outside the wheel, which turns a smaller wheel, which again moves a double crank inside the house, to which the plungers of the churn are attached. There are generally three dogs kept for each churn, and they work each an hour at a time. They are made to go faster or slower by calling to them. At gentlemen's houses they were fat, and seemed to like their work well, but at the peasants' houses they were not so comfortable looking. On one occasion a dog who was ordered to work to show me the process, displayed the greatest reluctance, but on my noticing it, the peasant assured me it was only because he knew it was not his regular time.

The cultivation of flax forms a most important part of Belgian agriculture, but the subject is too extensive to be included in the present communication; perhaps I may ere long say something about it.

I think the following recipe for the cure of red water is worthy of being made public. I received it from a German friend, and it is the recipe of an old Pomeranian shepherd, who declared it *never* failed. I had it a considerable time in my possession, before I had an opportunity of trying it on a cow of my own; and until I had done so with success, I was unwilling to prescribe it among my neighbors lest it should prove fatal. It however cured a cow of mine, and I have since given it in above twenty cases, almost all among my own tenants, and with perfect success, except in two cases, when the animals were at the point of death before they got it. It is a mixture of equal parts of Oleum Philosophorum, Olerum Aspic, Oleum Terebinthum; sixty to seventy drops in half a quart of lukewarm water for a middle-sized cow, and from thirty to fifty for a calf, according to size. If it does not cure in twelve hours, repeat the dose. I have never known more than two doses required. The materials can be furnished by Baildon, successor to Butler and Co. 74 Prince's Street, Edinburgh.

From the Troy [N. Y.] Budget of January 2.

RECENT AND DISASTROUS LAND-SLIPS IN TROY.

Early last summer, many of our readers are aware, a large mass of clay burst from the hill on the east section of the first ward of this city, followed by a gushing stream of water, and doing no other injury than covering a large portion of ground at the base with the bowels of the hill. Last evening about 7 o'clock, a similar occurrence took place on the same spot, but, we regret to say, greater in extent, and *exceedingly fatal in its consequences.* An avalanche of clay came tumbling from an eminence of nearly 500 feet, moving down the base of the hill to level land, and then continued from the impulse it received, to the distance of about 800 feet, covering up acres of ground, accompanied with a cataract of water and sand which kept up a terrible roar. The mass moved along with great rapidity, carrying with it two stables and three dwelling houses, and crushing them and their contents in thousands of pieces. The stables and horses were moved to a distance of over 200 feet, into an hollow on the corner of Washington and Fourth streets.

In its way the avalanche also encountered a brick-kiln, burying it partially over and crumbling it together, from which a few minutes after the flames rushed forth and lit up the city as with a great conflagration. This signal was the first intimation that was had of the catastrophe, to those not in the immediate vicinity.

The three dwelling houses destroyed were of light structure, and are occupied by Mr. John Grace, another by Mrs. Leavensworth, and the third by Mrs. Warner, the last of which was

fortunately vacant at the time of the calamity. In Grace's house was himself and wife and little boy. *The two former were extricated from the ruins dead*, and the boy was taken out alive, very little hurt, bare footed and bare headed, the buildings having been shattered in a thousand pieces—which is undoubtedly one of the most singular escapes that ever came to our knowledge. There were four of Mrs. Leavensworth's family in her house—herself and three children. Two of the children were in bed at the time, and probably asleep, and were afterwards taken from the midst of the wreck, dead, crushed almost to a jelly, and were undoubtedly thrown instantly from a natural sleep into a sleep of death. Mrs. Leavensworth was taken out shockingly bruised, and was barely alive when we last heard from her. Fortunately three of the family were at church at the time, and escaped awful deaths.

The stables were owned by Mr. Bingham, in which were 22 horses, and all carried along with the mass together, with nine or ten dirt carts. Six horses were taken from the ruins alive—the other sixteen were killed. The dead bodies of the horses can this morning be seen mingled among the ruins. Mr. Bingham's loss must be considerable.

We learn that the body of a person was found, name unknown, who was probably employed in the brick kiln or stables—which makes in all *five dead bodies* taken from the ruins last night. There are probably others buried among the ruins, as it is likely some persons at the time were in the stables or brick kiln.

The avalanche passed over a public highway which leads to the mill and nail factory, and might have carried along with it some straggling traveller. The clay is piled up in masses to the depth of from 10 to 40 feet over a large surface. It must have moved with great rapidity, and it is fortunate that it had not happened at the time when the laborers were employed in digging from the hill. At the time it was snowing freely, and this morning the scene was entirely covered with a white veil.

The scene that presented itself in the early part of the evening was awful in the highest degree. The horrors of an earthquake could not have presented a more dreadful spectacle. In the midst of a mass of convulsed earth, a multitude of human beings were moving to and fro—some carrying torches and others digging among the ruins, and dragging from the midst the remains of some lifeless body, or were rescuing some one in whom life had not yet become extinct—some were crying "ho! ropes, ropes!" "help," "shovels," &c. while the scene was dimly illuminated by the flames from the burning brick kiln, which is yet smouldering like an almost exhausted volcano. The scene must have been witnessed to be realized—we can give but a faint description of it.

Five large trees were precipitated from the hill, some of which are now standing erect at the bottom, and others in a slightly inclined posture. The whole is considered a singular phenomenon, and its immediate cause is the result of much speculation.

We have endeavored to give all the particulars that have come to our knowledge—in doing it in great haste, a few inaccuracies may have crept into our statement, but in the end it will be found generally correct.

From the [British] Northern Whig, October 1835.

A MOVING BOG.

This rather rare phenomenon has been lately witnessed on a part of Lord O'Neil's estate, in the neighborhood of Randalstown, on the Ballymena road and about two miles and a half from the former town. The following is the substance of a letter which we have received from a gentleman who was at the place on Saturday last:—"On the 19th ult., in the evening, the first movement occurred. A person who was near the ground was surprised to hear a sort of rumbling noise, as if under the earth; and immediately after, his surprise was not a little increased, on perceiving a part of the bog move pretty rapidly forward, a distance of a few perches. It then halted, and exhibited a broken, rugged appearance, with a soft peaty substance boiling up through the chinks. It remained in this state till the 22d, when it suddenly moved forward, at a quick rate, covering corn fields, potato fields, turf-stack, hay-ricks, &c. not a vestige of which now remains to be seen. So sudden and rapid was this movement, that the adjacent mail-coach road was covered, in a few minutes, or rather moments, to a depth of nearly twenty feet. It then directed its course towards the river Maine, which lay below it; and so great was its force, and such the quantity of matter carried along, that the moving mass was forced a considerable way across the river. In consequence of the late heavy rains, the river has again found its channel through the matter deposited in its bed, otherwise the water would have been forced back, and immense damage done to the land on the banks. The fish in the river have been killed to a great distance. The damage done by the mossy inundation has been very considerable. About 150 acres of excellent arable land have been covered, and rendered totally useless. Down the middle of this projected matter a channel has been formed, through which there is a continual flow of dark peaty substance, over ground where only two weeks ago the reapers were at work. A house close by the road is so far overwhelmed, that only a part of the roof is to be seen. Besides the actual damage sustained, the utmost alarm prevails and the people living adjacent to the place have been removing their furniture, &c to a distance. All manner of absurd reasons are assigned to account for the destroying visitation; but as the cause is one of a natural and sufficiently well ascertained kind, it is useless to dwell upon the solutions offered by ignorance."

From the Quarterly Journal of Agriculture.

ON THE CULTURE OF BRANK, OR BUCK-WHEAT.

By Mr. Main, Chelsea.

Notwithstanding this plant is probably a native of China and other warm climates, it may be cultivated in all the northern countries of Asia and Europe. This is owing to its being an annual of very quick growth, requiring only a summer of two or three months to bring it to perfection. It even ripens in the short summers of Siberia, and is considered exceedingly valuable on *poor light*

soils, where the other more valuable cereals do not prosper.

In the north of Europe it is much used as an article of human diet, as well as food for all kinds of live stock. It yields a flour of remarkable whiteness, and, on the continent, is very commonly mixed with that of rye or wheat, by both public and private bakers. In England it is sometimes used by bakers and confectioners in the manufacture of their finest fancy articles; but never in common bread or other food. It has been malted and tried in the manufacture of beer, but the liquor, though palatable, is *dangerously* heady and unwholesome.

Vast quantities of this grain are annually imported into this country from Holland and other northern countries, for the use of the gin distilleries; and who also buy all they can get of British growth, which not being kiln-dried, as most of the Dutch grain is found to be, is more valued.

It is a good deal cultivated in some of the poorest gravelly districts in the south of England, but only on *fallows* intended for wheat. In such light sandy or gravelly countries, the fallow-fields are thoroughly worked and cleaned by the first of June: they are then drawn out into ridges, ploughed and immediately sown. If convenient, the dung intended for the fallow is carted on, and spread and ploughed in, before the brank is sown; or this work may be deferred till the crop is carried in, in the autumn, just as it may suit the business of the farm.

A bushel of seed is enough for an acre, and if laid on regularly, when the ground is loose and warm, the plants soon make their appearance, and grow with great rapidity; so that the ground is soon covered and shaded by a dense mass of foliage. It begins flowering in July, and is generally fit to mow about the beginning of October. It is usually cut with scythe and cradle; and this implement in the hands of an expert workman is astonishingly expeditious. A good hand will cut down four or five acres per day with apparent ease. The scythe is *put out* for the purpose; and though nothing is cut easier than the green succulent stems, the scythe requires to be swung by a tall and strong man.

The crop is delivered from the scythe in swathes, as regularly as if laid by hand; and if the weather be fine, it quickly withers, and becomes fit to be carried to the rick-yard or barn. If put together a little green or damp, it does not much signify; for though ever so mouldy, the grain is never damaged, and the more mouldy it is, the easier it is thrashed. It is the easiest of all barn-work for the thrasher; as the slightest blow separates the grain from the straw; and as the latter shrinks into very small bulk, is never bound, and only fit for litter, it is soon out of the hand of the thrasher.

Three or four quarters per acre is a fair crop; its price generally ranges with that of barley, though, when much wanted by the distillers, double the price of barley is freely given. It has been proved a thousand times over, that the crop of wheat after brank is always better than if the fallow had been kept naked all summer, and whether the ground be dunged before or after the brank. This crop not only shades the ground, and smothers every weed, but leaves the soil in a fine mellow state. In wet summers, when the fallow cannot be cleaned early enough for a crop to be housed, a cast of seed is sown in August, to be ploughed in as a dress for wheat; but it is a very unsubstantial and fugitive kind of manure.

The uses of brank to an English farmer are but few. Horses should never touch it, because it heats and fills them full of bad humors. Neither is it good for fattening any kind of animal except pigeons and poultry; and it is the favorite food of pheasants, whether wild or tame. When given to store-pigs, it should only be in the proportion of one-third to two of any other kind of corn; that being the greatest quantity that can be given with safety. If pigs be allowed to range the brank stubble, they are very soon seized with delirium, and a violent kind of madness, running into water, rolling in mud, and crying in the utmost distress; and if allowed to repeat their visit to that stubble, fall away in condition most rapidly.

From it being so much and so constantly used in Russia and other parts of the continent, even as bread-corn, without hurtful effects, we must suppose that its deliterious qualities are dissipated by the oven, or in the process of cooking. But of the effects of brank grown in England, as stated above, I have been witness to repeatedly; and every farmer in those districts where it is commonly raised, is equally aware of its hurtful effects if uncautiously used.

Still it is a useful crop for shading poor thin land, if it can be sown after the fallow is perfectly cleaned, and be got off in time to sow wheat. A buckwheat farmer is, however, always considered an unfortunate man; because the cultivation of it shows the poverty of his land, and there are very few prosperous farmers upon land naturally poor.

But this is assuming that all gravelly or sandy soils are steril, which is not universally the case. I have seen much very productive sandy soils in the county of Bedford in England, and in the neighborhood of Musselburgh in Scotland. On such land brank may be raised successfully, especially in favorable summers; and even if the crop of grain be scanty, its service in keeping the ground shaded, and free from weeds, will benefit the succeeding crop, whatever it may be. I may also mention, that there is another crop raised by farmers on such soils, with the same view as that of sowing brank, namely, sowing trefoil or yellow clover thickly on the fallow, as soon as it is completely cleaned. This rises and becomes a very close sward before the beginning of September, at which time it is begun to be folded off by sheep, leaving the staple in a clean and rich order for the reception of the wheat seed.

I know not whether brank has ever been tried on the north side of the Tweed, or even to the northward of the Trent; but succeeding in much more northern latitudes, it certainly may have a chance even in the colder parts of Britain. But it must be considered, that a continental summer, though shorter, is much more uniformly warm than in any island, though farther to the southward. It is the *changeableness* of the British climate, much more than its want of temperature, that is so fatal to tropical vegetables; and as brank is as tender as the kidney-bean, a night frost in the end of September, or early in October, would destroy a principal part of the crop. After the grain is set, however, no degree of frost can damage it. I have often cut and carried a good crop after every leaf has been killed by frost.

The flowers are sweet-scented, and yield much honey, and consequently are much visited by bees; but the value of the honey is deteriorated, as it is much darker colored, and said to be inferior to that collected from heath and other wild flowers.

Whether brank will ever be an object of cultivation to light land farmers in general, is questionable; but from the present posture of agricultural affairs, many things will be introduced into our present systems, and many expedients had recourse to, to increase, if possible, the produce of the land, which have never before been thought of. Raw materials for the manufacturer, qualities for the dyer and druggist, and even that luxury tobacco, may come in for a share of that labor and care which has been heretofore wholly bestowed on raising the necessaries of life for man. Steam-power, as applied to the transit of farm products, as corn and fatted stock, and to that of lime and other dressings, is working, and will continue to work, important changes in the old routine of agriculture. Local advantages will be moderated, and local disabilities will be henceforth assisted in a way that but few are now aware of.

Extract from an Address to the Middlesex Agricultural Society, By Albert H. Nelson of Concord.

IMPROVEMENTS IN CULTIVATION.

We may learn the principles of farming then, by study, and why in the name of common sense may we not study books? Why should we be obliged to grope along, to stumble on in the thick darkness which our ancestors exerted themselves successfully to dissipate, when we may walk firmly and surely, would we but open our eyes? To illustrate my meaning. A young man comes into possession of a farm composed entirely of light sandy soil. His predecessors have, year by year, raised by dint of much labor, a small crop of burnt up hay, a small crop of potatoes, and a smaller crop of stinted corn. Now shall he toil on all his days, ploughing, sowing, and cropping the same fields in the same way, and with the same results, as did his ancestors? Or, would it not be far better for him to farm a little by book? To study the nature of calcareous and siliceous soils, to learn the different effects and qualities of manure, to introduce the turnip and clover culture, and a rotation of crops; and thus by the aid of a little science, double his produce and the value of his land at the same time? Shall he continue to cultivate certain articles without any regard to their adaptation to his soil, or shall he study the nature of the soil somewhat? Can there be a doubt as to what should be done? Our farmers work with their eyes wide open, I allow. They adopt improvements as fast as they are made in their neighborhood, so that they can see them; but they adopt *only* when they can see them. New modes of cultivation, and new articles of culture, are in this way gradually introduced. But they are introduced too slowly. The work does not go on fast enough. They do not keep up with the improvements of the age. There is much hesitation and doubt, after the time for hesitation and doubt has passed. The good old way, with all its imperfections, is adhered to in preference to a newer and better, merely because the one is old, and the other new. Our farmers have a thorough contempt for new things, and especially if promulgated by a book farmer, and in this way lose great advantages. Illustrations of this fact are abundant. How much writing, and argument, and persuasion it has cost to obtain for the mulberry, and the making of silk, their present partial and limited confidence! How slowly has the cultivation of Ruta Baga been progressing—and how much more slowly the raising of lucerne. How hard it is for people to give up keeping a little mountain of soil round each hill corn: how hard to use the roller and cultivator: how hard to give up cross ploughing! Or to illustrate this same feeling in a different way, it was forty years after spinach was introduced into the gardens of the opulent, before it could be bought in Boston market: and I doubt not but that there are those present who now hear the name for the first time. The rhubarb was twenty years in coming into favor: the tomato, the best of all summer vegetables, nearly as long: and the salsify is now hardly a regular marketable vegetable. While the sea kale of Great Britain has not been able to tempt a single cultivator, head lettuce as well known as it is, is seldom raised in the country, and the cauliflower more seldom still. "But the disgrace of being slow to receive valuable novelties, is not confined to our farmers and gardeners alone. The medical faculty of Paris proscribed as poisonous the potato, one hundred years after that plant had raised millions of vigorous troops who under Marlborough had again and again beaten the finest armies of France.

* * * * *

How few farmers there are that actually study the nature of soils and manures, and crops? How few make any improvements save those they see instituted by their nearest circles of neighbors? All such they are willing to make. Now I ask, and the question contains the gist of the whole matter, why a man may not as well learn from the results of the neighbors' experiments and science when stated in a book, as when seen on a farm? Extend the same principle. Great men, practical men, in every part of the world, and for many years, have investigated the subject of agriculture, and have written on it: their plans and experiments as well successful as otherwise, have been noted; experiments have been properly instituted. Now if a farmer may learn from a book written by his neighbor, may he not much more learn from this collected wisdom of the whole world? Is it not a fact, and may we not point to shining examples from the members of this society, that those who have studied books, and become book farmers, are the best farmers, and have the best and most productive farms? Being willing to learn from those men, as we all are, and thus from books second hand, and why are we not willing to go ourselves to to the fountain head, and thus become pioneers in the cause?

* * * * *

I have thus, gentlemen, stated some reasons why you should prosecute agriculture as a science, and have thus briefly noticed some of the modern improvements in that science, in order to induce in your minds the question "Why may we not accomplish what others have accomplished?" And I ask the question—why may you not? Who shall say that an American cannot do as much as

an English farmer? Who but the American himself, when he says he cares not for the science or the study of agriculture, and that he spurns such learned words? He who adheres to old customs, while every body about him is adopting newer and better, will fall far behind the age. And that farmer who continues to farm as did his ancestors, who entertains a sovereign contempt for scientific cultivation, will find himself every day growing poorer, because his more enlightened neighbors are every day growing richer and richer. I know that to treat farming as a science, to adopt the late improvements, or at least many of them, calls for a considerable outlay of money. But the investment is sure: the returns must be enormous for the amount expended: and they will themselves furnish the means of further improvement. There are multitudes of examples of what may be done in this way. Mr Coke of Norfolk, England, furnishes the most illustrious instance. Some forty years ago, he inherited a vast landed estate, the increase of which was then, $8000 per annum. Being an active and intelligent man, he introduced the Tullian system, which consists in a frequent rotation of crops, and in sowing in drills, and in his life time, by the plough and a proper succession of plants alone, he increased the income of his estate to $200,000; or, in other words he increased its value 24 times. Of him it was said, that "he disdained to hide his head beneath a coronet." Something like this every man may do. If we have not thousands to double every few years, we have hundreds or tens; and the smaller the sum, the the more the need of this result. The means are in every man's hands. There is no necromancy in the case; no peculiar skill is needed. Diligently use the faculties God has given us, and the advantages which our institutions secure, and the whole is accomplished.

We in New England have already done much. Our hills are rough and rocky and steril; our winters are long and tempestuous; our climate is inclement and unfavorable; but our arms have been nervous aud our hearts strong, and the rough steril fields have become gardens. The lines fell in rough spots to our fathers, but they have been made very pleasant homes. The founders of New England had difficulties to contend against, but they have been overcome. Just two hundred years ago, in 1636, a gentleman writing to England of the soil of this country says, "after five or six years it grows barren beyond belief; and whereas after, the land in England proves fertile for grass, this yields none at all, but like the land about Dunstable, puts on the face of winter in the time of summer." * * * "For the present we make a shift to live—but hereafter, when our numbers do increase, and the fertility of the soil doth decrease, if God discovers not means to enrich the land, what shall become of us, I will not determine—but it is probable we must either disband ourselves, like beasts straitened in their pasture, and so be liable to destruction from the natives (I mean the Pequods,) or else continuing together, be made the subject of some fearful famine and the misery that accompanieth it." How great the change! Two hundred years ago, the 10,000 inhabitants of New England feared a famine! Now more than two and a half millions are supported in the same country, and the energies of the land are not developed to the hundredth part! We apprehend no famine now: we fear not the sterility of the soil: we war not with the Pequods: our midnight slumbers are not disturbed by the howlings of ravenous wild-beasts. Peace, prosperity, and plenty is in our land. The little handful has grown to a mighty host. Our efforts have been prospered, and the earth has smiled. And now instead of fear for the issue, and prayers for succor, we confidently anticipate the time when in agriculture, as in everything else, we shall stand pre-eminent before the whole world. Truly may we say there has been a change! And shall it stop? or shall it go on? Shall we rest satisfied with what has been done, now that our energies are just beginning to be developed, and now that we have inducements greater than ever to press onward? By you, Gentlemen, and such as you, is the question to be solved. By directing to the science the same mental power, that you devote to anything else, and the same unwearied diligence, everything desirable will be attained. True, we have not the great staples, the sunny clime, the fertile soil of the south: but we have not slavery. True, we have not the luxuriant prairies and mighty rivers of the west: but we have what is wanting in those places, the good old fashioned New England habits of economy and industry. We have not the blessings of many other lands; but at the same time we have not the curses that are entailed upon them. We have everything that is needed to induce our surpassing all other lands in this science; and it rests with you, gentlemen, and your fellow workers in this cause, to say whether or not these results shall be atttained.

From the Historical Magazine.

EARLY SILK MANUNACTURE IN THIS COUNTRY.

The introduction of a new branch of profitable industry into a country, must necessarily attract much public interest, as being immediately connected with the prosperity and happiness of all its inhabitants. Recently much attention has been awakened, by efforts to promote on an extensive scale, by means of societies and incorporated companies, the culture of the mulberry tree, with an ultimate view to the production of silk, either for exportation in a raw state, or for domestic manufacture. The legislature of several states, have favored these efforts by liberal and valuable charters, and congress has considered the matter of so much importance as to make it, through its committees, (selected with great care,) the subject of minute and expensive investigation. During the progress of legislative action, which has at different times, within a few years past, been had on this subject, various statements have been made, both in memorials of petitioners, and in reports of committees, that are not only deficient in the presentment of many particulars of interest, but exceeding erroneous in those that are given. Our object in alluding to this matter, is not to shed any new light on the processes of producing raw silk, or its manufacture afterwards. We profess no knowledge on the subject derived from practical experience, nor have we any specious or learned theory to present. But our only object at present, is to preserve some facts connected with the early history of the

silk culture, which we cannot doubt, from present appearances, is destined to open a wide and profitable field for the exercise of American industry and skill. The subject may be dwelt upon hereafter more elaborately.

In a collection of Essays, published by Jared Elliot, of Killingworth, Connecticut, a gentleman who united in himself the three professions of a divine, a physician, and an agriculturist, we find many interesting particulars in relation to the production of silk. Mr. Elliot was an honorary member of the "society established in London, for the encouragement of arts, manufactures and commerce," and his zeal for making experiments which might result in benefit to America, was quickened into greater exertion, from his connection with that institution. The society, as appears from a pamphlet published by them in London, in 1761, note the following gentlemen as their American correspondents, who were also to pay premiums in their respective colonies, "for merchantable raw silk, raised and produced therein," viz: Dr. Jared Elliot, the Rev. Mr. Thomas Clap, (President of Yale College,) and Jared Ingersoll, Esq. of Connecticut; Benjamin Franklin, LL.D., and John Hughes, Esq. of Pennsylvania; George Pollock, Cullen Pollock, and John Rutherfoord, Esqrs., North Carolina.

The premiums were arranged by the London society, as follows:

"For every pound weight of cocoons produced in the province of Georgia, in the year 1761, of a hard, weighty, and good substance, wherein one worm only has spun, three-pence.

"For every pound weight of cocoons produced in the same year, of a weaker, lighter, spotted or bruised quality, though one worm only has spun in them, two-pence.

"For every pound weight of cocoons produced in the same year, wherein two worms have interwoven themselves, one-penny."

These premiums were, by resolution of the society, to be paid, so far as the province of Georgia was concerned, by Mr. Ottolenghe, superintendent of the silk culture therein, "to every person who would bring his or her balls or cocoons to the public filature at Savannah, according to notice (then) sent to Georgia."

The mode of proof to establish claims to premiums was minutely regulated. The fact to be established, was "that the silk has been actually and *bona fide* reeled from cocoons of the claimant's own raising and produce;" and the sum which should be paid by the society's correspondents, were to be repaid to them or order, severally, by the society, upon receiving accounts of the same properly attested.

It appears that the first attempt in this country to cultivate the silk business, was made in Georgia. The writer is not informed with regard to the time of its commencement there, but from a note appended to the essay of Doctor Elliott, and which is quoted at length, it certainly appears that the enterprise of Georgia, under the administration of Gov. Oglethorpe, first embarked in the manufacture of the American silk. The note is quoted at length, as it refers to an "account from Georgia," not in the possession of the writer, but which may be yet preserved, and in the possession of others.

"By a late account from Georgia," says Doctor Elliot, "it appears that the silk manufactory is in a flourishing way. In the year 1757, the weight of silk balls received at the filature, was only 1052; last year produced 7040, and this year already above 10,000; and it is very remarkable, that the raw silk exported from Georgia, sells at London from two to three shillings a pound, more than that from any other part of the world."

At the time when Mr. Elliot's essay was published, Georgia was increasing in the silk business. The writer is unacquainted with the reasons that have since led to its abandonment. Georgia, Pennsylvania and Connecticut, were specially selected as silk districts. The reason of this selection probably, was, that it was deemed important to test the advantages of different climates in raising the mulberry tree and the production of silk. The writer is not informed with regard to the result of experiments, if any were made, in Pennsylvania. The condition on which premiums were to be granted in Connecticut, as connected with the resolutions of the "London Society," was, that a public filature should be established in the colony, under the direction of the correspondents of the society, "to which every person should bring his or her balls or cocoons." A severe loss was sustained by those who were engaged in the silk business in Georgia, in the year 1758, by the filature or store-house taking fire, and being consumed, together with a quantity of raw silk, and *eight thousand weight* of cocoons. The quantity destroyed, enables us to form some judgment with regard to the extent of the silk business at that early day. Doctor Elliot says, that in the year when his essay was written, (1759,) those who had given their attention to the production of silk in Connecticut, informed him that "it was more profitable than any other ordinary business." He gives the two following authorities as confirmatory of his opinion.

He says, "some years past, I asked a man of good faith and credit, who had then made the most silk of any among us, what profit might be made of it; his reply was, that he could make a yard of silk, as cheap as he could make a yard of linen cloth, of eight run to the pound, &c. A woman of experience in this business, told me, that in the short time of feeding the worms and winding the silk balls, she could earn enough to hire a good spinner the whole year. I have not (adds the Doctor,) the least scruple of the informers' veracity. but how far their capacity might serve for an exact calculation, I know not."

The writer has been unable to ascertain the precise time when the colonists of Connecticut first directed their attention to the production of silk. That it was far anterior to the time specified in the memorial recently presented to the legislature, for the incorporation of a company, (upon which memorial and corresponding report of a committee, a charter has been granted,) is shown conclusively by the following extract from Doctor Elliot's essay.

The Doctor says, "I have been informed that at a place called Falkner's Island, which lyeth opposite to Guildford, there are vast number of young shoots (mulberry) which grow with such eagerness and obstinacy, that notwithstanding all endeavors to destroy them, the utmost efforts of the proprietors of the island, both by plough and scythe, has been used successively *many years*, as

good hap is, without being able to accomplish it. A number of us here, (Killingworth,) and in the neighboring towns, with the leave of the owners, design to supply ourselves from them the next spring; for I apprehend that this way of transplanting young trees, will be the most expeditious, to get furnished for the silk trade."

As the essay from which the above extract is made, was written about eighty years ago, and the "plough and scythe" had been used for many years anterior to that period, in attempts to extirpate the mulberry, the planting of the trees must have been soon after the settlement of the colony. As we intend to confine this article to the early history of the silk culture in our country, (reserving for a future number, its decline and subsequent advancement;) it may be pardonable in us to pay a tribute of respect to the memory of a gentleman, to whose valuable labors we are chiefly indebted for the facts stated in this number. We cannot do better than by saying, that in the quietness of his character, in his social enjoyments, in his hours of meditation, and in the innocence as well as usefulness of his labors, he seems to have afforded a practical illustration of the truth of one of his paragraphs on the culture of trees. "Such groves (says he,) are proper places for retirement, study and meditation; this will have weight with those who love contemplation--those who are wise and good; he that is not company for himself, when alone, will be none of the most pleasing and edifying company for others; shallow minds who have no fund for their own entertainment, will afford but poor entertainment for others. The loneliness of a grove, the solemn shade, the soft murmur of the air in the tree-tops, all conspire to soothe our passions, calm the perturbations of the mind, recover our fleeting, wandering thoughts, and fix them on proper objects; here is true pleasure and serenity beyond all that pomp or noise can give; surely it is not without foundation, that in all ages and countries, trees and shady groves have been the favorite subjects of poets, both heathen and divine. It is needless, and it would be endless to recite what has been written on this darling subject: and I cannot forbear turning to one passage in Isaiah, the beauty of which has not been taken notice of. "The mountains and hills shall break forth before you into singing, and all the trees of the field shall clap their hands." This (says the Doctor,) is expressed with a grandeur and dignity, well adapted to the sublime subject, and is truly exalted and poetical.

REMARKS ON THE USES, VALUE, AND CULTURE OF SWEET POTATOES.

To the Editor of the Farmers' Register.

Columbia, South Carolina, January 5, 1837.

The interest on agricultural subjects seems to have much diminished of late in this part of the United States, and as much as I can perceive, in other parts also. When we have done with president-making, and the meetings of abolition societies at the north and west, we can talk of nothing else than rail roads. It is all very well, each in its proper place; but it seems to me, that we neglect too much our own natural, noble pursuit, agriculture. Formerly, this country furnished many parts of Europe, and the West India islands with bread-stuffs; but now Europe sends us flour, wheat, and other grains in great quantities, and *mirabile dictu*, even *hay*. I shall not attempt to seek for the causes of this anomaly, lest it should lead me into the interminable speculations about banks, currency, abundance or scarcity of money, good, bad, and indifferent. It seems enough to say here, what few will dispute, that there is something wrong in all this. Leaving then, these most elevated and fruitful subjects of discussion, I shall take the humbler task of making a few observations on the culture of the sweet potato.

At the 474th page of the number of your Farmers' Register, for the last month, in a piece signed S. Carter, this gentleman, very reasonably disbelieves the assertions of some of his neighbors, that the potato vines are poisonous to cattle; or, at least, that they occasion them to swell. As for the latter effect, it is very possible, that potato vines, as well as other rich succulent food, may, when eaten too greedily, or too abundantly, have that effect. It is, however, little to be feared at the season of the year when Mr. Carter speaks of cutting his vines for provender; for then, much of their succulence has dried up, and probably given place to highly nutritious matter. The saving of the vines of the potato for cattle is not practised in this state, that I know of; but it is not that they are not worthy of it; but because we are too careless in taking every advantage offered us by a bountiful climate. It may also be on account of the difficulty of curing these vines, so as to keep them in bulk. As to their nutritive quality, there are very few vegetables more wholesome and nutritious. Many years ago, I was informed, on authority scarcely to be doubted, that in the island of St. Domingo, horses and mules, were in many parts, entirely fed all the year round on potato vines; and my informant assured me, that he knew a cultivator in the vicinity of Cape Français, who made yearly about $10,000, by sending, every day, potato vines to the city, where they were bought for the exclusive food of horses, mules and cattle. On the plantation or farm of this cultivator, the vines, and not the roots, were the chief object.

I am glad to have it also in my power to strengthen the authority of Mr. Carter, as regards his experiment of planting small potato roots, for the purpose of producing sprouts to be transplanted in due time, into the beds prepared for them. This is a practice much followed in this state, and many persons, I among the rest, think these sprouts produce much the best potatoes for the table. It is a method well suited to those countries where the summer is too short to produce the potato in perfection, by any other. The usual way is to prepare a nursery bed of small dimensions, in a warm and sheltered situation, by manuring it highly with stable manure; make drills in this bed at very short distances from each other, from five to ten inches, and in these drills put small potato roots, so close as to touch, and cover them lightly. This should be done earlier than the usual season for planting the crop; and for fear of frost, the seed may be covered with straw, leaves, or some such matters. A bed about four feet wide, and fifty or sixty feet long, will furnish sprouts enough to plant at least an acre of ground. It is necessary to have the beds ready to plant the sprouts, so as to take advantage of every shower

of rain to transplant whatever sprouts are large enough, that is a few inches high. The nursery bed will soon again be covered with a new set to plant at the next suitable weather. Potatoes produced in this manner, are generally smooth and well formed, and the crop very abundant. Every facility afforded, for the extended cultivation of this invaluable root, is undoubtedly a great advantage; for it is nutritive and wholesome in a high degree. Many planters in this state feed their negroes for several months exclusively on sweet potatoes, and during that period, they are all, young or old, healthy and fat. I have very little doubt but it might be advantageously cultivated for the manufacture of sugar, which it would probably produce in greater abundance than the beet; for not only sugar can be extracted from its ready formed saccharine matter, but also from the starch which it contains in great abundance. This is, at least, well worth the trial.

I am, very respectfully, sir,
Your obedient servant,

N. HERBEMONT.

THE PROPER DISTANCES FOR PLANTING CORN.

To the Editor of the Farmers' Register.

I hold it to be an axiom, that any subscriber to a useful and punctual periodical, who does not contribute to its support, by paying his subscription, and furnishing any useful facts or theories of which he is in possession, is worthy of any punishment which a jury of editors would inflict.

Not choosing to subject myself any longer to the penalty due to such an offender, I send you my subscription and my mite of matter. The first will, I hope, justify you in paying the post, whether the latter is worth printing or not.

In this world of fancies and Yankee notions, each man has his hobby. Some ride to the south, some glide swiftly on the bosom of the smooth canal; some fly through the air in balloons; some rattle on a rail road, and I, Mr. Editor, ride into my cornfield, and speculate on the value, while I am enraptured by the beauty of that queen of plants.

While all the world is agog for cotton, the poor corn is neglected by all but those who eat it. Let us turn our eyes to it, while I give you the results of some experiments and calculations on its culture.

On the Eastern Shore of Virginia (that most prosperous of all corn countries,) I am told it is the habit of the planters to plant their corn four feet each way—a single stalk at a place. When I first commenced farming, my impression was, that the most economical method of cultivating corn, all things considered, was to plant it so as plough it both ways, and thereby dispense with the hoe-work. I tried it. Experience and reason have changed my opinion. In 1835, I cultivated a light sandy field in corn, (much such land as that on the Eastern Shore, but not so good.) Part of it I planted 5 by 3, and part (the best land) 4 by 4 feet—both were ploughed both ways, and received the same culture: the cut 4 by 4 was favored rather the most, because it seemed to suffer. The result was, the corn 4 by 4, suffered for distance, while that 5 by 3, had a plenty of room, and was a good crop. This set me to thinking—and the result of my cogitations amounted to the conclusion, that corn must have a plenty of distance one way; else why was the corn 4 by 4 too thick, while that 5 by 3 had distance enough—when there were more stalks on an acre of the latter, than on one of the former—which reminds me, that many persons, and they intelligent and educated farmers too, think—no, conclude without thinking—that because 4 and 4, and 5 and 3, and $5\frac{1}{2}$ and $2\frac{1}{2}$, 6 and 2, and so on, when severally added, make 8—that, therefore, there are the same number of stalks on an acre, planted in either way.

This you know is not the fact—on the contrary, the number of stalks is inversely as the *product* of the two numbers. For instance, the number of stalks on an acre 4 by 4, is to the number on an acre 6 by 2, as 12 is to 16. The reason is this—more land can be contained in a square, than in any other rectangular figure—consequently, there are fewer squares in an acre, than there are of any other rectangular figure—so, also, the nearer these figures approach to a square, or the farther they are removed from one, the less, or the greater is their number.*

This important consideration, together with the fact above stated, resolved me to cultivate my corn this year on a different plan.

I accordingly planted it $5\frac{1}{2}$ feet one way, and $1\frac{1}{2}$ to $2\frac{1}{2}$ feet the other, according to the quality of the land. My corn was as good, and better worked in this way, and I cultivated it with as little trouble. By using an X wooden drag, twice in a row, about a week after each ploughing—first, when the grass begins to spring, you leave your land as level, and keep it as clean, as you can by cultivating it in any other way—hoe or no hoe. Moreover, the greater the distance one way, the less your corn will be ridged by ploughing; and, therefore, the more dirt you can throw immediately around it without injury. If I am wrong in any of my deductions, I hope you, or some experienced corn planter, will put me right: for, until experience or reason changes my views, I will plant any land 6 by 2, which, according to old style, would be planted 4 by 4. There are $\frac{1}{4}$ more stalks on an acre of the former, than on one of the latter. I contend the last is the thickest. In the mean time,

I am, yours, &c.

SIX AND TWO.

ORONOKO AND PRYOR TOBACCO.

To the Editor of the Farmers' Register.

Ward's Fork, Charlotte.

Having made some experiments, during the past

* The proper and simple rule for comparing spaces, or distances of plants, is to multiply the length and breadth together, and thus ascertain the number of square feet given to each plant, or station. Thus 4 by 4 feet, makes 16 square feet, and 6 by 2, 12 feet only. Yet simple and obvious as is this truth, it is both true and surprising, (as stated by our correspondent,) that many old and experienced corn planters still compare the spaces, afforded by these and other different distances, by *adding*, instead of *multiplying* the length and breadth together.—ED.

season, with the two most popular kinds of tobacco, to wit, Oronoko and Pryor, (well calculated to test their respective merits,) I herewith send the result, for publication in the Register.

Believing, that notwithstanding the little interest felt in the tobacco crop at present, it is a matter of considerable importance to those who cultivate it at all, to know which kind it is most to their interest to plant. Having thought for several years, that the Oronoko tobacco, matured earlier, and yielded more in weight, than any other tobacco I had ever made—I proceeded during the last season, to submit that opinion to the strictest test, by actual experiment in the following manner. While setting out a rich highland lot, with Oronoko plants, we got some Pryor plants, from a neighbor's bed, close at hand, and planted a row nearly through the centre of the lot, with those plants. And after having given the whole lot the same cultivation and attention during the season, I designated a row of Oronoko, running parallel with the Pryor, for experiment; and in the month of September, when the row of Pryor was thoroughly ripe, (by which time, however, a number of the plants in the row of Oronoko, had, to all appearance, suffered for the want of cutting,) I proceeded to cut the two rows, laying the plants to the right and left, and after they were "limbered" sufficiently by the sun, I carefully weighed them separately, and found the following result—to wit: 48 plants of Pryor, weighed 62 lbs., and 48 plants of Oronoko, weighed 78 lbs. Difference in favor of Oronoko, 16 lbs. I then had both Pryor and Oronoko, hung on sticks separately, placed in a barn, and cured with fire—and again submitted them to the same test, with the following result; Pryor, where cured, weighed 18 lbs. Oronoko, when cured, 22½ lbs.: difference 4½ lbs. in favor of Oronoko. On stripping the two parcels, the difference still greater in favor of the Oronoko—the stalk of the Pryor being much longer and harder than the Oronoko. I would remark, that I made a large cutting in the above-mentioned lot, ten or twelve days before the experiment rows were cut, at which time, there was not a plant of Pryor ripe, but several of the Oronoko ought to have been cut. I think from the best observations I have been able to make, the Oronoko, is from ten to twenty days forwarder than the Pryor, which is a matter of considerable moment, to those planters whose lands have become slow, from excessive cultivation. And when we add to these advantages, the still more important one—that the Oronoko, commands a much higher price for manufacturing purposes, I am decidedly of opinion, that it ought to have the preference over all other kinds for general cultivation. The only objections I have ever heard against it, are, that on rich wet land, it breaks and "fires," more than other kinds. As to the first objection, I am satisfied that a leaf need not be picked up that breaks off, and much more of it will be made, than of any other. As to the second objection, I am not probably qualified to judge correctly—for in the cultivation of fourteen crops of 100,000 plants each, I am satisfied I have never lost 500 plants by "firing." My land is uncommonly free from that objection.

I also made an experiment with plastered and unplastered tobacco (all Oronoko,) with the same care, with the following result: 40 plants of unplastered tobacco, after being cured, weighed 13 lbs.—40 do. of plastered, when cured, weighed 16 lbs.—difference in favor of plastered, 3 lbs. This tobacco grew on a lot that has been kept up mainly by clover and herdsgrass, on the three-shift system. The tobacco was only plastered once, about the time it began to spread, on the hill generally, with about a tea spoonful to each plant. The difference was manifest during the whole season, even at three hundred yards distance.

I had also several experiments almost consummated, on corn, by pulling and not pulling fodder, cutting and not cutting tops, all of which were carefully put away in my farm pen, preparatory to measuring and weighing. When lo! my plans were suddenly *dashed* by a mischievous ox, breaking in upon them, not only in violation of the Sabbath, (on which it happened,) but also the law of "*quare clansum fregit.*" I hope, however, at a future time, to be able to mature similar experiments, and communicate the result for publication.

R. I. GAINES.

GOOD AND INCREASING EFFECT OF MARL.

To the Editor of the Farmers' Register.

Berkley, Charles City, January 3, 1837.

* * * * * *

Before closing this letter, I have an act of sheer justice to perform. Some sixteen years ago, you were liberal enough to allow me permission to procure several vessel loads of marl from your shores. These were applied principally to a belt of land, and running through a large field, which contained all the varieties of soil from a cold white pipe clay, to a light loam; all, however, greatly exhausted. Shortly after its application, I discovered a considerable improvement in the land; and with a view of equalizing the fertility of the adjacent ground, I applied a considerable quantity of stable and farm-pen manure, to a strip on one side of the marled belt. The succeeding two or three years, both pieces exhibited fine crops; since that period, the difference between the marled land and manured belts, is every year more manifest; and I think, it may be said, with entire truth, that the portion marled, is fully equal to the production of ten barrels of corn per acre. When last in wheat, my principal scythe-man, on approaching it, remarked to his fellow-laborers, "this is a monstrous growth of wheat—there must have been an old farm-pen here;" another replied: "It is no farm-pen, but the marl from Mr. Ruffin's." As I believe your journal is of great public utility, I sincerely wish you success in it,

And am respectfully,

BENJ. HARRISON.

For the Farmers' Register.

APPLES AND CIDER.

A writer in the Register, who has spent his "two last summers and autumns in the apple regions of the north," has collected thirteen propositions. With some of them I entirely agree, and from others I entirely dissent. The evidence cannot rest on the personal knowledge of your correspondent, but must have been derived from

hearsay. I therefore feel myself at large, to question it, without infringing the rules of civility.

I live on lands flowing with cider of the best sort; I have drank it freely from my boyhood; I greatly prefer it to ardent spirits, and all kinds of wine, except champagne, to which it nearly approaches, when well made of good fruit, and carefully bottled. I have always thought it salutary to myself, and when my servants have it in plenty, in the fall, I have supposed that it kept them in good health, spirits, and temper. The late Doctor Rush, a man of profound science, and deep observation, recommended cider as a healthy beverage for laboring people. Governor Barbour highly approves it—and the late Doctor Dwight, a laborious student, and devoted christian, speaks of it as the best remedy for a nervous headache—and recommends it to men of sedentary habits. Against these high authorities, your correspondent has been led to believe that a hogshead of good cider was pregnant with almost as many evils, as the fabled box of Pandora.

I agree that a still is a bad appendage to an orchard, and that distilling cider is an error, both in profit and morals: but candor obliges me to say, that a small dash of good old peach, or apple brandy, greatly improves punch, and apple toddy.

There are orchards on my farms, to the planting of which, the memory of man doth not run. The impression here, has been, that cider lessens the inclination for whiskey and rum—and thus tends to preserve the morals of the blacks; and it is very rare to see intoxication among them by cider. Some years ago, finding my apple trees were declining, I planted new orchards: they are now in full bearing, the fruit is fine, and the cider is excellent. In doing this, (in addition to my own personal gratification,) I felt a moral obligation to make wholesome provision for posterity. If I could be convinced that, in rearing orchards, I had laid a foundation for "rheumatism," "inflamed eyelids," "headache," "bleeding at the nose," "sores and ulcers," "affections of the stomach and bowels, and premature trembling of head and hands," I would do by my orchards, what I understand you are doing in Virginia, (under the salutary influence of the temperance societies,) by your mint beds—root them all up.

I am pleased to learn that sweet apples, are excellent food for horses, cattle, and sheep, and that they keep the horses of practicing physicians, in Connecticut and Massachusetts, sleek and fat. I wish B——y J——n, and Dr. M——e, would try them on their racers. To their opinions, entire confidence would be attached—and it would make an important change in agricultural economics. I once knew of a herd of fifteen milch cows, breaking into an orchard of sweet apples, at night, and thirteen of them were down next morning with the colic, and were saved only by heavy drenching with ley. Your correspondent has also learned, at the north, that hogs, if they can get sweet apples, care nothing for Indian corn, and will fatten without it. My hogs had the run of my orchard, last fall, of sweet apples, which they abandoned for acorns, as soon as they began to fall; and they required four weeks feeding with Indian corn to make them prime pork. Northern hogs, like northern men, may have their peculiar tastes. Yankees delight in pumpkin pies, and molasses. Southrons prefer pork, and hominy.

I have rarely seen a cider drunkard to the south, and have always supposed that intoxication had the same effect upon the moral and physical constitution, by whatever means it was produced. Climate may cause the difference. Brandy, gin, and rum, if we can believe travellers, have but little effect on northern men, and northern women. A Russian countess, after drinking six glasses of brandy, will dance a waltz with a firm foot and a steady head. A Maryland, or Virginia lady would find her balance doubtful after one. I have somewhere read of a young physician, who had studied in Germany, and who, upon his return to England, cured a Frenchman of a fever, by a salt herring, at Calais, and next day killed an Englishman at Dover, by the same prescription.

Yankees are a queer guessing hoaxing people. In the absence of other game, they will prey upon each other; but when they start a southron, they all open upon him, like a pack of fox dogs on a stray cur.

From the Farmer and Gardener.

LIME SPREADER.

[The difficulty of making an uniform distribution of any given quantity of lime on an acre of ground, and the injury experienced by laborers engaged in the operation, have long been felt by the agricultural community, and we are, therefore, happy in believing that both these inconveniences have been obviated by the invention of our ingenious townsman, Francis H. Smith, Esq., who we believe has succeeded in so constructing a cart that any given number of bushels of either stone or shell lime may be equally spread over the entire surface of a field of any dimensions. His cart has been submitted to the test of practical experiments upon the farms of several of the gentlemen in this vicinity, and as we learn, gave the most decided satisfaction in every instance. The last experiment is thus flatteringly spoken of by several of our most extensive and intelligent landholders, and from our personal knowledge of the accomplished inventor's acquaintance with mechanics as a science, we have no doubt it will receive the approbation of the entire farming and planting interests.]—Ed. Far. and Gard.

Having this day witnessed at the Orange farm, the operation of F. H. Smith's machine for spreading lime, we cheerfully unite in giving our opinion of the result. The shells were thrown into the cart direct from the kiln. These were sufficiently ground up and distributed with uniformity over the land as the cart was moved along. We are of opinion that no manual operation could do the work so well. The quantity per acre, judging merely from observation, in the three several degrees exhibited to us, was about 50, 100 and 200 bushels. It is evident however, that the quantity may be regulated at pleasure. This experiment was made with *shell* lime. One of the undersigned has, with the machine, covered seven acres with *stone lime*, with great expedition and to his entire satisfaction. We are of opinion that it is equally adapted for spreading ashes, marl, or any

friable manure. We are so well pleased with the machine that we have each of us ordered one from Mr. Eastman.

J. W. PATTERSON,
JAMES SWAN,
ROBERT GILMOR, Jr.
S. W. SMITH,
WM. DONNELL.

Baltimore, Dec. 29, 1836.

J. S. Eastman has now put twelve of the above machines in hand, which will require six or eight weeks to complete. Part of them are already engaged; those who wish to have it in time for operating in the spring, and advised to have their names at his Agricultural Warehouse in Pratt street.

The cost of the machine, including the patent right, is $100. To apply the machinery to a wagon or cart $45. In five minutes the machinery may be detached.

MR. WHITMARSH AND HIS AGENT.

[In the last No. of the Farmers' Register, we inserted from the "*Silkworm*," an account of the *transactions* of Mr. Whitmarsh, in regard to *his* Chinese mulberry seeds and plants, with our comments thereon. We now republish, from the Genesee Farmer, the defensive replies of both Mr. Whitmarsh and his agent, to an editorial article of severe and well deserved censure, which had appeared in that paper. We are quite willing to make Mr. Whitmarsh's defence as extensively known, as the censure of his course: but, notwithstanding, will express our opinion, (very different from some of our brother editors,) that his letter falls far short of exculpating him from the intention to deceive purchasers, and willingness to pocket the profits of their being deceived. What the purchasers wanted, and expected to obtain, was the *morus multicaulis*, universally understood to be meant, in this country, by the name of "Chinese mulberry,"—and not *another Chinese mulberry*, the merits of which are just now discovered, or brought to light, by Mr. Whitmarsh's observations, and which may, or may not be, superior to the *morus multicaulis*—and which few persons would have cared to buy, if announced in that manner at first, and still fewer *now*. As to Mr. Huntington, the agent, his best defence would have been, that he, like the public in general, was *cheated* by the language of his principal's first recommendatory statement: but he has forfeited that ground of defence, by having failed to expose and apologize for the deception, after he learned it, and by continuing to press on the public the sales of this mulberry—whether a new and valuable species, as alleged by Mr. Whitmarsh, or merely *dead* plants and damaged seeds of the common white or Italian mulberry, as supposed by the nurserymen who have planted them. If Mr. W. had at first stated, plainly and fairly, his views as now expressed, as to the superior value of a new variety of mulberry, his opinions would have passed for what they were worth. No blame could have attached to him in case of disappointment to those who might have relied on these first and hasty impressions—and if not found to be mistaken, he would have been justly acknowledged (as his defenders claim to be his due,) to have acted from a desire to benefit the interests of his country. But it is evident that such a course would have put but little money in his pocket, compared to the inducing a belief that purchasers would obtain from him seeds and plants of a variety whose value was already so well known, that the eagerness to possess it seems something similar to the prevailing mania for speculation in gold mines and western lands. Hence, a sufficient reason for Mr. Whitmarsh's choice, supposing him to prefer solid cash, to barren praise and honor.]—ED. FAR. REG.

From the Genesee Farmer.

We very cheerfully give place to the following letters, that Messrs. Whitmarsh and Huntington may derive all possible benefit from the publication of their statements; and our only regret is, that these letters do not afford a more satisfactory reply to the statement published in this paper on the 3d inst. Here are the letters, to which we append several notes, which we deem necessary to a correct understanding of the subject:

Northampton, Dec. 11, 1836.

L. Tucker, Esq.—*Sir:* I have read with pain an article in your paper of the 3d inst., in which you accuse myself and agent, C. P. Huntington Esq. of deception—willful deception—in the sale of mulberry seed last spring. This, sir, is a most serious charge to make, and that too, without the slightest evidence, and respecting those of whom you say you know nothing. Would it not have been well to have made some inquiries? or even have addressed me on this subject? Mr. Huntington, I trust, is able to answer for himself. I will only observe, that if any deception has been practised, it must rest on my shoulders.

Has there been any deception in the case? You say positively that there has. May I ask in what? [*a.*] Was it that the seed did not vegetate? or that I intended that it should be received as the Multicaulis? That it did not vegetate as well as could be wished, is most certain—of that I could not be aware, as I had no means of trying it—it had every appearance of good seed. Was it sold as Multicaulis? [*b.*] I answer most decidedly, it was not. In my search for Multicaulis seed, I was told that it could not be had in Italy or France—that the tree produced but little seed, and that little could not be depended on; but they had a small quantity of *Chinese mulberry* seed—which was more hardy than the Multicaulis, and better in many respects. I was shown the trees, along side of the Multicaulis; the thermometer then standing at 5° *below* zero, and had been the day before at 14° *below*. I compared trees of three years old, down to those of seed grown in August, with the white, and found every indication of a hardier tree than any we have in our country, and better than any I had seen in my travels—one well calculated for our climate—the leaves from six to eight inches, and very close jointed. I forwarded the seed to my agent, which he did not receive till my arrival, on the 28th or 29th of April. I immediately caused notice to be given by letters and otherwise, that this *was not the Multicaulis*, but a distinct variety. Nine-tenths of the seed

was purchased or delivered to order, subsequent to the notice. I have now orders from several persons (well acquainted with the facts,) for the same kind, which I am daily expecting, and that too, in preference to the Multicaulis, which I now have received, and which was raised in the *Phillipine Islands*—not in France, as was supposed by my agent. The nurseryman—who wrote you that sweet letter, wishing you to chastise me—could not distinguish between that and the white!! Does he know a white oak from a black oak? I must take leave of the subject by repeating that there has been no deception practised, and that in my opinion, at least, the plants are more valuable than the Multicaulis, which time will decide.

As you, perhaps, will not be willing to credit my assertions respecting the seed, I enclose you the original bill as I received it from the hands of the person who signed it, erasing the figures only.

In publishing the article you have wronged deeply wronged, my agent and myself. I appeal to your sense of honor and justice, and request that my letter be inserted in your next number, that those interested may form their own opinions.

Respectfully,

SAMUEL WHITMARSH.

Northampton, December 12, 1836.

To the Editor of the Genesee Farmer:

Your paper of the 3d inst., has been handed me, in which you have indulged in certain strictures upon Mr. Whitmarsh and myself, in relation to the sale of mulberry seed. Mr. W. informs me that he has written to you, but as you have seen fit to include me in your denunciations, I beg leave to say a few words for myself. As your remarks breathe a spirit of prejudice, not to say hostility, I think it would have been more fair, had you not prefaced them with demonstrations of candor and disinterestedness. I hope you did not intend by these professions to give more point to your poisoned shafts, and though at heart you may feel reluctant to admit this communication, yet that you will feel bound by your avowal of impartiality to give to the public, through your columns, a brief statement of facts, so far as I am concerned.

The advertisement of the "Chinese mulberry," which you copy from the Hampshire Gazette of March 28, was ordered by Mr. Whitmarsh while in Europe, and its terms, and description were dictated by him. This was the first knowledge I had of his purchasing or intending to purchase seed. I then supposed, as you say others did in your vicinity, that it was the Multicaulis. Mr. Whitmarsh did not arrive till quite the last of April, and the seed did not come to hand till after his arrival. It was not until I saw him that I found it was not the Multicaulis, and I immediately stated in the Hampshire Gazette, that it was not, in the paragraph which you have carefully preserved and copied. [*c.*] I was, myself, solicitous to do away any incorrect impressions which I had innocently given, and Mr. W. also stated expressly, that he did not wish any one to take it, except with a knowledge of the facts. This correction would come to the knowledge of all the readers of the Gazette, and of all the exchange papers which were requested to copy that advertisement. Not only this, I took particular pains *before any orders had been supplied,* when personal application was made for seed spoken for, to state that it was not the Multicaulis, and I so stated where it was sent abroad, [*d.*] except when the season had so far advanced that it was too late for delay, when time had been given for the information to be diffused, and when I had ascertained that purchasers were almost in every instance, as well satisfied with the article sold, as with the Multicaulis. In one instance, an individual demanded a return of his money because it was not the Multicaulis, in so insulting a manner, that I referred him to Mr. Whitmarsh. It is not true, as you state, that an agent was despatched to Rochester with the seed. [*e.*] Messrs. Reynolds & Bateham had sent a very urgent order, and a gentleman of this town happened to be going to Rochester on a visit, just as the seed arrived, and I requested him to supply R. & B.'s order, as a favor to them. He took a few other papers and sold just seven of them, and no more. He was particularly instructed not to sell it as the Multicaulis, and to inform purchasers that it was not the Multicaulis. I have seen him to-day, and he tells me that he perfectly recollects those instructions, and that he gave the information to those few who bought of him, and *to Reynolds & Bateham themselves.* [*f.*] This was the only seed delivered or sent away before the notice was given in the Gazette that it differed from the Multicaulis, that I recollect. You see then, that the foundation on which you rest your weightiest charges is removed, and of course, the whole fabric of false accusation falls to the ground. Your main charge, so far as I am concerned, is, that this information was not given, "*till after the orders had been supplied.*"

Besides the refutation given above, the very paragraph you quote from the Gazette of May 4, shows its falsity. That article begins, by saying, "the Chinese mulberry seed which we advertised but a few weeks since, has come to hand, and can be had by calling at our office," &c. stating the price, &c. that it was not the Multicaulis, and quoting Mr. Whitmarsh for the character of the plant. I had previously informed persons giving orders, (in the Gazette, I think,) that they would be notified through its columns, of its arrival. Here then is a paragraph for the first time, announcing its arrival and price, and yet from this paragraph, you infer that most, if not all, of the orders had been supplied! [*g.*] The public will judge what your inferences are worth. They can determine whether one would be likely to advertise the arrival of an article, after it had been already sold! whether it should have been at the pains of informing persons who had given orders that their seed had arrived, when they had it already in their possession! Indeed, it appears from your statement, that Reynolds & Bateham knew that it was not the Multicaulis, for you say that they refused to sell it on this account. How could they have known it in less than a week after its arrival, except through ourselves? As to the quantity of seed in a paper, I never weighed or counted them, relying upon Mr. Whitmarsh, and in him, I had then, and have now, perfect confidence. He has throughout manifested a zeal, enterprise, and public spirit, rarely to be found. He has hazarded every thing in the culture of silk, except reputation, and that you and your backers seem disposed to take from him. As to the character of the plant, I do not profess to be a judge, but I am

satisfied from the opinion of our best cultivators of trees, that your seedsmen and nurserymen, if they have not been imposed upon by pedlers of spurious seed, are but poorly fitted to talk about trees, from cedars down to the hyssop.

Yours, &c.

C. P. HUNTINGTON.

Notes.

[*a.*] The deception charged, consisted in advertising and selling a spurious seed, for that of the Morus multicaulis; and the deception is explicitly acknowledged in the above letter of Mr. Huntington, where he says:

"The advertisement of the Chinese mulberry, which you copy from the Hampshire Gazette of March 28, was ordered by Mr. Whitmarsh, while in Europe, *and its terms and description were dictated by him.* * * * I THEN SUPPOSED, as you say others did in your vicinity, THAT IT WAS THE MULTICAULIS." "*It was not until I saw him* [Mr. Whitmarsh,] *that I found out it was not the Multicaulis.*"

[*b.*] We answer that it was, inasmuch as it was sold under the advertisement which Mr. Huntington acknowledges deceived him into the belief that it was the Morus multicaulis; and that it was *bought* as the Morus multicaulis, the following statements abundantly show:

Mr. L. Tucker—As you wished to know the circumstances of my obtaining the mulberry seed of Mr. Whitmarsh, or his agent, I will state them. Mr. Bradley, a gentleman living in this vicinity, informed me that a friend of his, Mr. Fancher, from Northampton, was at his house, and that he had some of the Chinese mulberry seed for sale. I requested Mr. Bradley to ask Mr. Fancher particularly, if the seed was the Morus multicaulis, or the Chinese mulberry, and if he could say that it was such, I would take three papers; but if he (Mr. Fancher,) had any doubts of its being the Morus multicaulis, or Chinese mulberry, I did not wish to take any of the seed. Mr. Fancher stated to Mr. Bradley, that he thought the seed was the Morus multicaulis, and that Mr. Whitmarsh would not impose on any person so much, as to sell seeds under false pretences; and Mr. Fancher left three papers of the seed for me. Mr. Fancher informed Mr. Bradley, that he had sold four or five papers of the same kind of seed in Rochester, also twenty-five papers in Utica, and had also sold at different places on the route from Northampton to this place, and that he had more of the same kind of seed for sale. Some days after I had purchased the seed, Mr. Fancher returned, and called at my house. I then told Mr. Fancher, that in my opinion, Mr. Whitmarsh had imposed on the public in the sale of his mulberry seed, as by his advertisement, the impression had gone abroad, that the seed he was selling was the Morus multicaulis, and that Mr. Whitmarsh's own proceedings would prove that to be the case; for after quantities of the seed had been sold, Mr. Whitmarsh had come out with a notice, informing people that the seed he had sold was not the Morus multicaulis, but another variety of the Chinese mulberry. Mr. Fancher replied, that if there was any deception, he was clear of any on his part, as he had sold the seed as it was represented to him.

Respectfully yours,

ASA ROWE.

Rochester Seed Store, December 21st, 1836.

Mr. L. Tucker—In answer to your inquiries I would state, that on seeing his advertisement of genuine Chinese mulberry seed and trees, we sent Mr. Huntington a letter, ordering $25 worth of the seed, and inquiring the price of the trees, to which we received a reply, dated Northampton, April 13th, stating that Mr. Whitmarsh and the seed had not yet arrived, but he had entered our names for five papers of the seed, adding, "it is more precious than gold dust, as you will perceive, having been collected at great expense, and warranted," &c.

On the 4th of May, a Mr. Fancher called on us, as agent for Mr. Whitmarsh, delivered our seed according to order, received the money, and offered to sell us more if we desired it. As the business was done with Mr. Reynolds, who is now absent on a journey, I cannot be positive as to all that was said, but I am confident that no intimation was given him of its being any other than the seed of the genuine Chinese mulberry, or Morus multicaulis; for when a few days afterwards, the article in the Northampton paper, stating that it was not the Morus multicaulis, was shown him in my presence; he expressed his surprise and disappointment, by saying, he believed it was all a hoax and deception, and suggested sending the seed back to Mr. Whitmarsh. But on reflection we concluded to sow it ourselves, and see what the result would be; accordingly we sowed it all, except one paper, and the product was, as has been previously stated, nothing but Italian mulberry, and but few of them.

Yours respectfully,

M. B. BATEHAM,

Of the firm of Reynolds & Bateham.

Mr. Tucker—In answer to your inquiry, I will state, that at the time I purchased the two papers of mulberry seed, alluded to in your paper of the 3d inst., no notice was given me that it was not the *Morus multicaulis*, and the first intimation I received, that the seed was not the genuine Chinese mulberry, was contained in the article from the Hampshire Gazette, of the 4th of May. I bought a quantity of the Chinese mulberry trees imported by Mr. Whitmarsh, and supposed the seed and plants both to be the genuine Morus multicaulis. The plants proved genuine—the seeds produced, as I believe, the white Italian mulberry, or a variety so similar to it as to render it difficult to detect the difference.

RALPH CHENEY.

[*c.*] The reader should bear in mind, that this statement was made in the Hampshire Gazette, on the *very same day*, that the agent, Mr. Fancher, was in this place.

[*d.*] Witness the copy of a letter from Mr. Huntington, to Mr. J. Swett, published in the Farmer of last week, which is as follows:

"Sir—Enclosed is a paper of Chinese mulberry seed, $5. You can have more, if ordered soon.—*C. P. Huntington, for S. W.*"

[*e.*] See Mr. Rowe's statement given above, in relation to Mr. Fancher's agency. We may also add, that we were in Albany at the time Mr. Fancher returned from the west, and he was spoken of there as,

and understood to be, the special agent of Mr. Whitmarsh.

[*f.*] See Mr. Bateham's letter. Mr. Reynolds also expressed to us his indignation, at what he considered a cheat, in the strongest terms, which he would not have done, had any such story been told him, as Mr. Huntington states.

[*g.*] Our inference was drawn from the fact, that the seed was distributed in this section, some days before the publication in the Hampshire Gazette could have reached this city, and not from the fact of that publication itself, which makes a very important difference. This, with the remaining part of Mr. H.'s letter, only shows his ability at special pleading, and the "public will judge what it is worth," when they call to mind that we have shown conclusively, that there was time enough, after the arrival of the seed at Northampton, to have supplied all the orders which could possibly have been received, before the announcement in the Hampshire Gazette, that it was not seed of the Multicaulis.

From the British Quarterly Journal of Agriculture.

ON THE APPLICATION OF STEAM TO THE PURPOSES OF HUSBANDRY.

It is now upwards of three years since, at a meeting of noblemen, members of parliament, and gentlemen connected with the landed interest, brought together principally by the exertions of the writer, the three following resolutions, which he had prepared, were unanimously adopted:

"*That* the application of steam to inland transport and agricultural purposes will, by cheapening the production and saving the consumption of the food of the country, be accompanied by advantages to all classes of the community of the most extensive and permanent utility, and that, as such, this meeting considers it highly entitled to their support, and that of society at large.

"*That* the practicability of applying steam to general locomotive purposes was satisfactorily proved by evidence before a Committee of the House of Commons in 1831, who reported the same to be 'practicable, safe, one of the greatest improvements in the mode of internal conveyance ever introduced, and entitled to legislative protection; and that, since that time, it has been farther and fully established by numerous successful experiments."

"*That* this meeting considers it desirable that an association be formed for bringing the measure forward in the most prominent manner, which its own importance, political and commercial, and the exigencies of society require, to be called a Society for Promoting the Application of Steam to General Transport and Agricultural Purposes."

This association, though about forty members of parliament consented to act on the provisional committee, from the various political changes which occurred during the sessions of the years 1833 and 1834, came to nought; but it proved to be the nucleus of that co-operation on the part of a few zealous and persevering friends of agriculture, which, after surmounting many difficulties and discouragements, eventually realized, on the 15th of December last, the formation, in the metropolis, of "The Central Agricultural Society of Great Britain and Ireland." On the occasion above referred to (23 of April 1833,) the Chairman Henry Handly, Esq. M. P., observed, that he felt himself incapable of doing justice to the position in which the meeting had placed him, having no mechanical or engineering knowledge, nor boasting any scientific acquaintance with the subject; he was, however, strongly impressed with its immense importance; he felt steam was the most mighty engine as yet confided to mortal hands, that its powers and resources had been hitherto but partially developed, and that he anticipated ultimately the greatest advantages to every class of society, from its application to the various purposes of transport and agriculture. Farther, he took occasion to observe, that he had, four years prior to the date of the meeting, entertained the project of the application of mechanical power to agriculture, and, for that purpose, had offered a premium for the invention of a steam-plough; he had the assurance of many scientific men that it was perfectly practicable, and he attempted to form a society with a view to its encouragement, but failed. He still entertained the same opinion as to the advantages to be derived from it, and felt that, as he feared the agriculturist would receive no legislative or financial relief, the only mode by which certain inferior natural wheat lands could be retained in cultivation would be by substituting inanimate for animate power, whereby diminishing the cost of production. In saying this he begged to observe, that were it probable the application of such a power would tend to diminish the demand for manual labor, he for one would never become its advocate. However, on the contrary, he felt satisfied it would very materially increase human labor, for, by displacing animal power, it would effect an enormous saving in the consumption of the food of man, and a reduction in the cost of cultivation. Colonel Torrens, M. P., who is well known to the public by his writings on political economy, in moving the first resolution, stated, that the Select Committee on Steam Carriages, which sat in 1831, of which he had been a member, had given the project a patient and full investigation, and had taken the evidence of a number of eminent engineers, and others practically acquainted with its detail: that the report embodied the full and explicit sense of the committee as to the practicability, safety, and utility of applying steam to the purposes of locomotion. In reference to the economic advantages that would result to society from this extension of mechanical power, he believed they would be very great. The bringing of agricultural produce more cheaply to market would tend to increase profits, to encourage industry, and to enlarge the demand for labor, whilst considering how it would enable us profitably to extend cultivation, and apply with advantage additional portions of labor and capital to the soils already under tillage, he did not consider it unreasonble to conclude that it will eventually double the wealth, prosperity, and population of the kingdom. These opinions were corroborated by Mr. Shaw Le Fevre, M. P., who moved the second resolution; by Sir John Sebright, Bart. M. P., and various other gentlemen, who addressed the meeting.

Having labored for years, by means of the press, to awaken the attention of the agricultural community to this, in our opinion, most important subject, it is with great satisfaction that we are enabled to inform our readers, that, since the date of our last paper (December 1835,) the application of steam to the plough has been made a matter o:

practical and successful experiment. The following is a correct account, by an eye-witness, of the recent exhibition, near Bolton-le-Moors, of the application of steam to bog cultivation.

"The adaptation of inanimate power to the tillage of the soil must evidently have been considered by practical men to present almost insuperable difficulties, or steam would, probably, long since have been substituted for horses and oxen, as the motive power of agricultural implements. Certain light operations of the farm, such as thrashing, churning, chaff-cutting, &c., which could be performed by fixed power, have partially occupied the attention of mechanics, and suitable machinery driven by water, wind, or small steam-engines, has to some extent been advantageously used for such purposes. But the idea of a 'steam farm,' of a farm to be altogether cultivated by steam, in lieu of animal power, has hitherto been treated as visionary and absurd, except by a few individuals, and one or two agricultural societies, who have enforced, in their publications, the practicability and importance of applying steam to effect the more laborious operations of agriculture. This desideratum is at length accomplished. Mr. Heathcoat, M. P. for Tiverton, the ingenious and the well-known inventor of the lace machinery, has the merit of having conceived and planned this additional and remarkable contribution to science, and to the wealth of his country. The invention, after years of costly experiment, has been matured and perfected through the enterprising liberality of Mr. Heathcoat, assisted by the mechanical ingenuity and perseverance of Mr. Josiah Parks, civil engineer, whom he selected to carry his designs into effect. The first machine has been constructed expressly for the cultivation of bogs, and has, for some months, been practically and successfully worked in Lancashire, on Red Moss, near Bolton-le-Moors. During the Whitsuntide recess of Parliament, a numerous assemblage of gentlemen from different parts of the country attended to witness an exhibition of this novel and interesting invention; amongst whom were Mr. M. L. Chapman, M. P., Mr T. Chapman, Mr. H. Handley, M. P., Mr. J. Featherstone of Griffinstown-house, Westmeath (an enterprising and successful bog-reclaimer,) Mr. F. Brown, of Welbourn, Lincolnshire, Mr. James Smith of Deanston near Stirling (well known to the mechanical world by his ingenious inventions, applied both to agriculture and manufactures,) Mr. B. Hick and Mr. P. Rothwell, engineer, with other experienced judges of mechanical contrivances. These gentlemen were unanimous in pronouncing the invention to be the germ of great improvements in the science and practice of agriculture, as well as eminently fitted for the particular purpose to which it has, in the first instance, been applied. Two ploughs of different construction were put in action, to the admiration of the spectators; particularly the one last invented, which is double-acting, or made with two shares in the same place, (?) so that it returns at the end of a "bout," taking a new furrow, without loss of time. The perfect mechanism of this plough—the action of the working coulters and undercutting knives, which divide every opposing fibre of the moss—the breadth and depth of the furrow turned over—the application of a new and admirable means of traction, instead of chains or ropes—together with the facility with which the machine is managed, and the power applied to the plough, especially interested and surprised all present. The speed at which the plough travelled was two miles and a half per hour, turning furrows eighteen inches broad by nine inches in depth, and completely reversing the surface. Each furrow of 220 yards in length was performed in somewhat less than three minutes, so that, in a working day of twelve hours, this single machine would, with two ploughs, turn over ten acres of bog land. The machine which bears the steam-engine is itself locomotive; but as the ploughs are moved at right angles to its line of progress, not dragged after it, the machine has to advance only the width of a furrow, viz. eighteen inches, whilst the ploughs have travelled a quarter of a mile; in other words, the machine has to be moved only eleven yards, in the time that the ploughs have travelled five and a half miles, and turned over a statute acre of land. This is, in truth, the prime distinguishing feature of the invention; it is the contrivance on which the genius of its author is more particularly stamped, and which seems to to be essential to the economical application of steam to husbandry; for it is evident, that were it requisite to impel the machine with a velocity equal to that of the ploughs, by dragging them with it, a great proportion of the power of the engines would be uselessly expended. Another valuable property appertaining to the machine, and which conduces greatly to its economy as a bog cultivator, is, that it requires no previous outlay in the formation of roads, no preparation of any kind further than a drain on each side of it. That a locomotive machine of such great dimensions and power could be so constructed as to travel on mere raw bog, was an excellence the more appreciated as it was unexpected by those persons who are conversant with the soft unstable nature of bog. The Irish gentlemen present also pronounced Red Moss to be a fair specimen of the great mass of the flat, red, fibrous bogs of Ireland, and that neither the machine nor the ploughs would have any difficulties to encounter in that country which had not been already overcome on Red Moss, the field of experiment. The engines are capable of working up to fifty-horse power, but the operations subsequent to ploughing will require a small force compared with that necessary for breaking up the surface of the bogs, to the depth and at the speed effected by these ploughs. The power consumed by each plough is estimated at about twelve horses, and the weight of the sod operated upon by the plough, from point to heel, is no less than three hundred pounds. The boiler is of unusually large dimensions for locomotive engines, being suited to the use of peat as fuel, so that the culture of a bog will be effected by the produce of its drains. At Red Moss, however, coals are so cheap, being found contiguous to, and even under it, that they are used in preference to turf. Eight men are required for the management of the machine and the two ploughs, or at the rate nearly of a man per acre; but it must be understood that this number of men will only be required for the first heavy process, and has no relation to any subsequent operations in the cultivation of bogs, nor to the application of the invention to the culture of hard land. After passing a sufficient time on the moss to witness the exhibition of the ploughs, and the various other functions and properties of the machine, the party expressed to Mr. Heathcoat the extreme pleasure they had received, and their earnest hope that he would extend the sphere of his exertions by applying the invention to the culture of stiff clay soils; and more especially to carry into effect those important operations of subsoil ploughing and improved drainage recently introduced to the agricultural world by Mr. Smith of Deanston. To effect these processes, great power is essential, and it was evident that Mr. Heathcoat's invention was equally well adapted to them, and would be attended with results no less important than those which will arise from its application to the reclamation and culture of bogs."

It may be interesting to our readers to give a brief description of Mr. Heathcoat's patents for his invention of "new or improved methods of draining and cultivating land; and new and improved machinery and apparatus applicable thereto—which machinery and apparatus may be applied to divers other useful purposes.

"These patents were obtained for England, Scot-

land, and Ireland in 1832. Prolonged and costly experiments have been required to mature the invention, and adapt it to practical use as a substitute for animal labor in many expensive agricultural processes, particularly in the culture of wet, heavy soils. Its first application has been made to the reclamation of bogs, which of all descriptions of soil offer perhaps the greatest natural obstacles to improvement by mechanical means. These obstacles are, however, effectually overcome. Various machinery, constructed expressly for the cultivation of bogs, has, for some months, been practically and successfully worked in Lancashire on a bog called *Red Moss*, near Bolton-le-Moors. The principal machine is locomotive, and is so contrived as to be capable of travelling on the surface of bogs, the consistence of which would be insufficient, previous to a long and expensive drainage, for sustaining the weight of horses. The moving power is steam, generated from the peat and water of the bog itself. The diggings from the drains furnish abundance of fuel; and the drains yield an unfailing supply of water. The prime agent, steam, is thus obtained at the cheapest possible rate; the local fuel requiring no transport, and the water no outlay in reservoirs or other constructions, to ensure a constant provision. By far the greater part of the power of the engines fixed on the machine is available, and employed to actuate the ploughs or other agricultural implements. These are moved at right angles to the line of progress of the machine, not dragged after it; the machine itself remaining stationary whilst the ploughs are at work between it, and two small auxiliary carriages, in the manner to be presently described. In commencing the reclamation of a bog, a roadway is to be first traced out in a suitable direction for the proposed operations. This is done simply by forming two drains parallel with each other, and about seven yards apart. The principal machine is launched on this roadway. No metal or material of any sort is necessary for its solidity; the machine rests on the raw bog, and bears on so large a surface of it that its buoyancy is insured. It also consolidates and dries the roadway by its pressure. The two auxiliary carriages are stationed (where space permits) at a distance of about 480 yards asunder: one on each side of the principal machine, and parallel with it. Each carriage is furnished with a large wheel, or pulley, round which a band passes, proceeding from, and returning to, the principal machine, whence it derives its motion by proper apparatus. These bands are connected with the ploughs, or other agricultural implements, which are drawn to and fro between the machine and the auxiliaries. One quarter of a mile of land in breadth, exclusive of the roadway and headlands, is thus operated upon on the two sides of the machine. The auxiliary carriages travel on four wheels, resting on planks, which from a moveable rail road. One of the planks is let into a shallow trench cut in the bog, against one side of which plank some friction rollers, fixed on the carriage, press, in order to resist the pull of the engines. Ploughing is the first agricultural operation. To accomplish this process in a thoroughly mechanical manner, and to adapt it to steam power, it has been necessary to contrive peculiar ploughs, furnished with sharp working knives, which divide every root and fibre of the bog plants, to the depth of nine inches, and turn over a furrow slice of eighteen inches in breadth, completely reversing the surface, and turning the heather side downwards. The underlying heath, moss, and other bog-herbage, facilitates the discharge of water, and permits the rain and air to penetrate the furrows. Drains are formed as the ploughing proceeds, that the vast qantities of water liberated by that process may be immediately carried off. After lying a few months in this state, exposed to the action of the atmosphere, the ploughed surface is found to be so considerably pulverized, that little remains to be done to fit it for the reception of grass-seeds. The complex operations necessary to prepare the soil for the culture of other and more important crops than grasses, will also be materially simplified and economized by awaiting the natural decomposition of the soil, which is so greatly expedited by this system of ploughing as a first process. It establishes a general under-drainage, which, with the assistance of numerous shallow gutters discharging into proper drains, will speedily create a soil on the surface of the wettest bogs. The machine and auxiliaries remain stationary during the time occupied by the ploughs in taking two furrows; they are then, severally, put in motion, and made to advance in three parallel lines, in order to keep pace with the breadth of land turned over, and to pull the ploughs accurately straight. The machine is impelled by the engines, and each auxiliary by its attendant man, who also shifts on his planks as occasion requires. The machine and its auxiliaries have thus to be moved over a space of eighteen inches only, whilst the ploughs have travelled 440 yards, and turned over 220 square yards of land nine inches in depth; in other words, the machine and auxiliaries have to be moved only eleven yards, in the time that the ploughs have travelled five and a half miles, and turned over a statute acre of land. The ploughs perform their work at the rate of two miles an hour, and are subject to very few stoppages; so that eight acres and three quarters, nearly, of bog would be ploughed up in a day's work of twelve hours, or, taking the average of daylight throughout the year, and making a liberal allowance for hinderances from weather and other causes, one machine would plough up 2000 acres in a twelvemonth. It is evidently impossible to state, with any approach to accuracy, the expense of draining bogs, as the number, nature, and dimensions of the necessary drains vary with the wetness, retentiveness, and other qualities of each particular bog. The cost of draining will be materially reduced by applying steam-power to suitable draining implements. In like proportion the expense of all other processes in husbandry will be diminished. The power of the engines will be used in conjunction with portable railways, for the conveyance of marl, and other kinds of manure or manuring soils, on the land. By these means, proper times and seasons can be selected for performing the various farming operations, the poaching (or injuring from the treading) of horses will be entirely avoided; open drains, where preferable, may be substituted for covered ones; and no outlay will be required for roads. The land necessarily lost by farm roads and communications between fields will be consequently saved to the occupier and the public, as the machine roadways will be laid down with grass, and thus become permanently productive, instead of being not only a positive loss, but a source of continual expense and trouble."

We now come to give some account of Mr. John Upton's steam-plough, noticed in our last paper, and for this purpose we will quote from a prospectus in which that able engineer and mechanist has set forth some of the advantages which he considers the agriculturists will derive from his invention. Mr. Upton is at present building a steam-plough, which he expects will be finished in time to enable him to exhibit his capabilities before the prorogation of parliament. Of late his factory* has been visited by many county members and practical agriculturists (amongst others by Sir Reg. M'Donald, S. Seton, Bart. Hon. Secretary of the Highland Society,) who have expressed themselves highly satisfied with the appearance of the machine, is lightness, compactness, strength, and manageableness. Mr. Upton has executed with the greatest credit to himself various important public works, and is a

* No. 7. New Street, Southwark, London.

practical engineer and mechanist of forty-five years' standing. The strongest expectations therefore are entertained that his steam-plough on trial will realize the favorable opinions that are formed of its efficiency.

"This steam-plough is worked by Upton's patent lever steam-engine, and his air furnace boiler. If a single shared plough, the space occupied by the entire machine will be four feet long by ten feet; if for trench ploughing, the dimensions will be the same; if for ploughing two, three, or more parallel furrows at once, the breadth and length will be about five feet by twelve feet. The work done by the trenching plough will be equal to any spade husbandry; and that by the parallel shares will be found very superior to any horse ploughing; inasmuch as the ground will not be trod and rammed down by horses' feet; and as the steerer or ploughman, &c. will ride on the machine, the land will be left as open and light as possible, and resemble that of garden culture. To the steam-plough a harrow, drill, and seed-box can be attached when requisite, and the entire operation performed at one going, when it is for the last ploughing, without trampling the soil. The spots left in the angles of the field by Upton's steam-plough will be smaller than by any horse-plough, as the steam-plough will turn, if a single share, in thrice the breadth and length of a common wheelbarrow; and if a three-shared plough it will turn in the space of a small one-horse cart. The simplicity of construction and small number of parts composing this steam-engine and boiler, and the great safety and security of the latter, will prevent the necessity of frequent or expensive repairs, as the only parts of the apparatus most liable to wear and tear are the ploughshares, the soles, coulters, and harrow tines, which will only require the same repairs as if drawn by horses. The engine and its boiler is calculated to go 50,000 miles, or more, before any repairs could be wanted, unless from accident or unfair usage, and whenever, from long use, very much worn, if the boiler were to burst, it could only extingush its own fire without injury to any person close to it. The plough will require one steady man to direct or steer it, and a tractable boy to attend the fire and turn the steam off and on occasionally, the engine being of the most simple and efficient construction. The water-tank will require replenishing now and then, and perhaps fuel will be required two or three times in the course of the day, and the boiler is admirably constructed for burning either wood, peat, or coke, or coal may be used. The single plough is ealculated to do two acres per day, and as the person will not be fatigued by walking over the rough ground, nor have any horses to rub down and feed after coming home from the field, they could remain out a longer time. The double plough would do four acres, and the three-shared plough would do about six acres per day. The counter or trench plough would do about two acres per day; but as it would be equal in power to the double shared plough it would require the same quantity of fuel and expense. The land cultivated by this plough would doubtless be found from its efficiency to produce crops nearly if not quite equal to spade husbandry, with which mode of cultivation I am thoroughly well acquainted from practice; and it would in such cases pay for the steamer the first season. As to the expense, there would be required one good steady ploughman, who never ought to receive less than 2s. 6d. per day, and a tractable boy or lad as firemen at 1s. per day, as thus:—One man per day, 2s. 6d.; one boy, 1s. per day. If coke is used as fuel, I shall state it at the London prices, although in many districts it is much lower, therefore, the single plough would require about twelve bushels per day, which, at 6d., is 6s. Ploughing two acres per day at 4s. 9d. is thus 9s. 6d. Now, it will appear manifest that if two acres can be ploughed per day with a single shared plough for 9s. 6d., six acres per day could be ploughed at a cheaper rate, in proportion, inasmuch as there would only be the same number of people employed as before:—Thus wages per day, as before, 3s. 6d.; fuel per day, as before, 3s. per acre, 18s.; ploughing six acres per day, at 3s. 7d. is thus £1: 1: 6. As the ground would not be trodden and rammed by horses or men in the various operations of ploughing, harrowing, sowing &c. there can be no doubt that superior crops would be obtained, and in some soils deep ploughing is very beneficial, which could be done by steam better than by horses, for steam never tires; and as for treading the ground it is generally very detrimental, for I have frequently observed that in some soils, wherever a horse's foot hole is left, corn seldom thrives to well, and in many instances in retentive land and cold seasons, perishes. I once had a good field of six acres of wheat entirely ruined and destroyed by a posse of horsemen who lived many miles away from my farm hunting in my fields; to complain was useless, and as to purchasing law, what farmer or tradesman can afford to pay for it?

"As to the expense of ploughing with horses, there is much variation, some soils requiring only two, some three, and some four; it will be fair therefore to take three as the average number. Now I took great pains to measure and find what was the lowest expense of my horses' keep for three or four succeeding years, and it amounted to twenty pence per day each, which is, I believe, five pence more than now is allowed for the the keep or starvation of a poor old worn out ploughman, or his master, for one entire week! Therefore a single team of three horses cost per day (and generally ploughed near an acre) 5s.; my ploughman received per day, 2s. 6d.; the driver, 1s.; in all, 8s. 6d. An acre of land, if ploughed by steam, would cost 3s. 7d. Difference per acre, and better work done, 4s. 11d. Although a good and perfect steam plough may be thought a very desirable machine for the West Indies, Canada, Australia, and the colonies generally, yet, unless it would do something more than plough and harrow, I thought it would not be approved of, and from my own practice in farming I know what is wanted by a farmer; and being by profession a steam-engine manufacturer and mechanist, think I know, or am more likely to know, and to produce what will answer the farmer's purpose much better than some of those itinerant philosophers, travelling speculators, and *soi-disant* steam-plough makers, who have been to my factory to endeavor to see what I was doing; but in vain, for I would show and explain nothing to them. Wishing to produce a machine of the utmost simplicity and general utility, I have so contrived my locomotive engine, that I can detach the ploughs, &c. from it, and send it away to the fold yard, where I will suppose there is a common dung-cart ready loaded for it to take away. My locomotive would take the cart to the field, where the steerer would have to tilt it in the usual manner, and then draw out as much manure to form one heap as he pleased—to form as many heaps as he pleased, or to tip and shoot the residue, or the whole load at once if required. The steersman would then take back the empty cart at a trotting pace, if he chose, and fetch another loaded one.

"The expense of hauling manure it is requisite to calculate from some given data, in order to ascertain the expense; and having, in the course of many year's practice as an engineer, paid as much for the hire of horse and cart work as almost any practical man in this or any other kingdom, besides keeping several good teams of my own, I shall go as near the wind's eye as I can carry sail, and assume a distance. Say the average distance is one-third of a mile out, and one-third of a mile back, and that the time taken up in tipping the load and exchanging carts would be equal to one-third of a mile more, making one mile in time and distance per load. Now, as my teams for years regularly did 20 miles of ground per day, when haul-

ing on the road, and I generally put on 20 loads per acre at a dressing, it would amount to 20 loads or 1 acre per day, at only two miles per hour, average time for one team; therefore say—team per day, 5s.; one man to drive and tip, 2s. 6d.; by horses per day or acre, 7s. 6d. Now my steam-engine, if not very hilly ground, would go at four miles per hour, or 40 loads per day, which at the same per day for man, boy, and for fuel, comes to 9s. 6d., the half of which is, per acre 4s. 9d. I shall not notice the filling of carts or spreading the manure, as in either case, whether of steam or horses, the expenses are the same. My locomotive engine would take the carts, &c. loaded with produce to market, at four miles or more per hour; and I think it might be so modified by further improvements as to be made subservient to many of the farmer's wants. It might perhaps be made available for the cutting of roots and fodder for stall-fed and other cattle; for the thrashing, winnowing, grinding corn, and pumping water, &c. In case of the last ploughing, when it is intended to sow and harrow in the seed at one going, the same power would effect the whole work, only requiring the aid of the boy, who must otherwise be engaged in driving the harrow horses, but which, horse labor and horse injury done to the soil would be done away with, and a further saving per acre effected by my steamer. The additional boy at the steam-harrow would be required to lift up the harrow occasionally, and take up the weeds, and put them in a basket hung to the machine, until arrived at the headland, where a spare cart might be placed to receive them, and which the engine would take out of the field every evening, or as many times per day as was necessary, As to the quantity and quality of work which such a steam-engine would do when compared with animal power; I shall assume a regular breadth for the furrow slice of eight inches, and from four to nine inches deep, according to the tenacity and stony qualities of the soil. At the above breadth, but at less depth, a horse-plough would make as many bouts per acre as would amount to twelve and a half miles, exclusive of ridgings and balks. My steamer would go twice as fast, and being more easily-managed and controlled than horses, would not be so liable to get out of line, and would, I think, do the work better, besides not having the fatigue of walking. I shall state what such a steamer would do upon a farm of 200 acres of arable land, premising that it would cultivate a much greater farm where desirable, and leaving the intelligent farmer to calculate the purchase and maintenance of the necessary horses, harness, plough-gearing, ploughs, harrows, &c.

Ploughing 200 acres per annum once over, at 3s. 7d. per acre,			£35	16 8
" 150 do., and harrowing again 2d time,	do.	"	26	17 6
" 150 do., and harrowing and seeding again 3d time	do.	"	26	17 6
" 50 do., fallow 3d time,	do.	"	8	19 2
" 60 do., hauling manure	4s. 9d.	"	14	5 0
" 60 days do. to market	6s. 10d.		20	10 0
" 30 do. harvesting (long days)	10s.		15	0 0
" 90 half days, equal to 45 days cutting fodder, &c.	4s. 8d.		10	10 0
			£158	15 10

"I must premise that my preceding calculations both of horse and steam tillage, do not contain the usual incidental expenses of filling carts and spreading manure, inter-furrowing and water-furrowing, draining, weeding, hoeing, &c.. none of which has been incorporated with the ploughing, harrowing, and hauling. Again, my scale of horse expenses is drawn from my own plan of keep, which proved so rational and beneficial to both cattle and owner, that I shall never adopt any other system, which was this:—I knocked down all the racks in my stable, but left the mangers; I cut clean sweet wheat and barley straw, with equal weights of best sweet hay; to this I added three-fourths peck of bean and oatmeal per horse per diem, which was well mixed up, and moistened with water out of a gardening can with a rose-head. I put a small handful of salt for each horse into the mixture, and when I could get carrots to chop up small, I added them, and deducted half the bean meal. As soon as the horses came in from work, a very small quantity was spread thin in the manger, and when this was *eat up quite clean*, another lot was put in, *so that there was no waste*—their bellies were soon filled, and they had time to lie down and rest. No man's horses worked harder, and no man's teams were in better condition; they were occasionally turned out to grass in the meadows on Sundays and during warm nights This cost me 20d. per day each, the year round, and on this plan I found my calculations of horse-keep. I think 200 acres, all arable land, would require 10 horses for tillage, with four men and two boys per annum, if the land is to be well worked and kept going, besides other hands for occasional works.

Therefore 10 horses kept at 20d. per day each, is per annum,	£303	6	8		
Ditto wear and tear of harness and shoeing, per annum,	45	16	8		
	£349	3	4		
Four good men and two boys, as before,	218	8	0		
				£567	11 4
Now, by my steamer, the expense of tilling 200 acres would be, as before stated,	£158	15	10		
To which may be added, one additional man and a boy, all the year round, at the same wages as before,	57	5	0		
And one pair of oxen, for furrowing, ridging, and earthing-up, and sundry other purposes, at 20s. per week the pair,	52	0	9		
				268	0 10
Saving in the tillage of 200 acres of arable land, per annum,				£299	10 0

Say purchase of 10 horses for 200 acres arable land, at £25 each,	£250
Do. for harness, plough-gearing, and for ploughs, harrows, &c.	100
	£350
Purchase of one of my locomotive steam ploughs, with two shares,	£350
	£350

"As the quantity of land in cultivation, whether by the plough or in grass, much diversity of opinion exists. One author makes his statement for England to be only 11,525,000 acres which I think is enormously below the truth; another, more than double the quantity in aration alone! But, during the past week, at a meeting in Bath, for a most excellent purpose *(God knows too long delayed,)* that of allotting small portions of land to laborers, for spade cultivation, it was there

stated by Dr. Parry, that England alone contained 29,000,000 of acres of cultivated land; and from all I have read on the subject elsewhere, I think that 22,000,000 of acres may be assumed as the probable quantity under the plough. If we allow the above, for the sake of showing how steam would benefit the agriculturist, as it has already done the manufacturer, I shall apportion 20 acres of arable land to the labor of each horse as before, with the accompanying number of attendants; then, supposing that a period should ever arrive when all the arable land shall be worked by steam, we shall have as follows, viz. in England:

22,000,000 acres of arable land, tilled by horse labor, at an expense of £567: 11: 4 for 200 acres, which is a fraction above £2: 15: 8 per acre, and amounts to the sum of	£62,150,000	0	0
The same, if cultivated by the aid of steam, at £268: 0: 10 for 200 acres, would, at £1 11s. 9½d. per acre, amount to	34,970,823	0	0
Annual saving to the agriculturists,	£27,179,177	0	0*

That the steam-engine would, at no very distant day, supply the place of animal labor in agriculture, and become as mighty an instrument in augmenting the productiveness of the soils, as it has proved in creating and economizing manufactures, in navigating the ocean, and in travelling on land, was many years ago predicated by Franklin—a predication reiterated by Davy, and latterly acknowledged and enforced by many distinguished agriculturists. The successful application of Mr. Heathcoat's invention to the culture of bogs—the most repellant and obstinate of waste land—leaves no doubt of its applicability to soil already in cultivation. Coals are now procurable throughout Great Britain, at prices which have caused the steam-engine to be extensively introduced as a substitute for animal labor in many of the processes connected with husbandry. Thrashing, cleaning and grinding corn, hay-choping, turnip-slicing, &c. are now performed by small engines fixed on farm premises; even the churn has its steam-engine managed by the dairy-maid; and so great is the advantage arising to the dairy farmer, from the regularity of motion, and economy produced by it, that hundreds of small engines for this familiar purpose alone, are used in the north of England, and in Scotland. But these are humble savings compared with the benefit to be derived from the vast steam power which may be brought to bear on the soil itself. Those agriculturists who are acquainted with the effects produced by the valuable subsoil plough recently invented by Mr. Smith of Deanston, will readily appreciate the importance of an invention which will enable him to employ that kind of plough at a much diminished cost per acre. Mr. Smith's plough, with steam power, will effect a revolution in agriculture. Implements of husbandry have hitherto been restricted in form, weight, and dimensions, to the powers and manageableness of a team of horses. A new class of instruments will take their place; the stiffest soils may be broken up and pulverized to any desired depth; strong clays, the natural wheat lands, may be profitably cultivated, rendered more fertile, and fitted to bear a better, and more systematic rotation of crops.

Such are a few of the benefits which landowners and agriculturists will derive from the substitution of steam for animal power in husbandry. It is also no slight advantage, in a national point of view, that this important change will be effected, unacccompanied by any of those temporary evils which too frequently attend the application of mechanical discoveries to existing arts. This invention will not displace a single human being from his accustomed healthy occupations; it will restore to the support of man a considerable portion of that large amount of produce now sacrificed to the maintenance of agricultural horses—it will furnish employment to the rapidly increasing rural population of the empire, by rescuing millions of acres of bog and waste land from obnoxious sterility—it will fix on their native soil multitudes of those poor Irish laborers who annually migrate to Great Britain in search of work and food, and who are forced, with numbers of our countrymen, to suffer the hardships and dangers inseparable from emigration to wild and distant regions.

The horses in Great Britain are said to amount to 2,000,000, each consuming annually what would be sufficient to support eight individuals—16,000,000 in all. Their entire displacement by mechanical means, would, therefore, in effect, be to add another island, large as Great Britain, with all its resources for human sustenance, to the seat of empire! What an insight does this give us into the indefiniteness of that divine command which was breathed in Paradise as a blessing over our race, "Increase and multiply, replenish the earth and subdue it." Have we subdued the earth? Can we subdue it? How does this incentive to rural activity—the precept of that *Parent of Good* whose intention it is that the mouths of all his children shall be filled with food, and their hearts with gladness—meet and overthrow the dogmas of those who have said to population and productiveness, "Hitherto shall thou come, but no further!" Mind shall indeed achieve her noblest triumph, when she shall no longer be confined to accommodating matter for the use and the comfort of man; but when she shall direct what in reality is a substance impalpable as the breath of heaven, to purposes which shall feed the hungry, clothe the naked, give employment to the idle, and, supplementing the energies of exhausted Britain, shall bid her, in renovated splendor and renewed age, walk on innoxious to that inherent decay which has put down in rotation all the extinct monarchies of the past, and bid her rival for ages to come, in extent of production, upon the petty surface of a few million acres, the limitless domain of her once western world.

We are happy to observe that the press of Scotland has of late been advocating the advantages to arise from steam husbandry; and we trust the time is not distant when the Highland and Agricultural Society will offer a liberal pre-

* Our Scottish agricultural readers will easily perceive that these calculations are founded on the rates of English labor and wages. We are quite satisfied that ploughing in Scotland with horses does not exceed the cost of steam-ploughing as given above, namely, 3s. 7d. per acre; but then the food at present consumed by horses would go to the support of human beings, were inanimate power substituted for animate. Would not such a result be beneficial to a populous country like Great Britain?—*Editor*.

mium,* *not for an effective steam-plough*, but for the first company for building steam-ploughs and hiring them out to the neighboring farmers, that shall successfully introduce this new branch of industry into Scotland. If some spirited agriculturists—for instance, the Marquis of Tweeddale, Lord Greenock, and Mr. Menteith of Closeburn—in their respective neighborhoods, would patronize the formation of such companies, each to commence with a capital say of £20,000, steam agriculture would simultaneously and extensively be introduced into the east, south, and west of Scotland. But if this invention were left to private and individual enterprise, in the present depressed condition of our farmers, half a century would elapse before its use would become general. Let our tenantry press this subject upon the attention of their landlords in their respective counties. What a relief in these times it would be, if each farmer, instead of keeping four, six, or more pair of horses, had only to send to the next village for a steam-engine, to do the work for which he has to feed and attend them during the year!

EFFECTS OF LEGISLATIVE AID TO AGRICULTURE IN THE STATE OF NEW YORK.

No. I.

[The private letter to which the following interesting communication is in reply, was written last spring, soon after the refusal of the legislature of Virginia to do any thing asked for by the Agricultural Convention, in aid of the promotion of agricultural improvement. We then supposed that a statement of what had been done for that object in New York, even though but partially successful, might furnish light, and either examples or warnings, to the friends of agriculture in Virginia, and especially to our legislators: and we therefore applied to our valued correspondent for the information desired, believing that no one was better qualified to furnish it, or was a more judicious or more zealous friend, to the true interests of agriculture. His answer has been delayed until now, by his ill health and absence from home. It is hoped, notwithstanding the lateness of the publication, that the facts stated may have some beneficial influence on the deliberations of our legislature now in session.

To those who have read the communication of Dr. Beekman to the first volume of the Farmer's Register, or who know him at home, it will be altogether unnecessary to say that he stands high, both as a successful practical cultivator and improver of the soil, and a scientific agriculturist. His continuation of this subject is promised very soon, and will appear in our next No. When concluded, we may offer some of our own views as to the manifest defects, as well as of the very great benefits, of the system adopted in New York for aiding agriculture by legislative encouragement.]—Ed. Far. Reg.

To the Editor of the Farmers' Register.

Dear Sir:—In your letter to me you say that "efforts, as yet ineffectual, have been made, and will be continued, in Virginia, to induce the legisture to aid in the diffusion of agricultural knowledge. In New York that attempt was formerly made, and, I believe, has been recently renewed, and in a different manner. It would be of much service to us to have a plain and sufficiently full narrative statement of what was actually done—what were the effects, good and bad—and your comments at length on what was correct and useful in effect, and what was injurious or defective in the system, as well as the recommendation of any better system, or particular measures. In treating this subject, you will have the advantage of experience added to all your other lights. No man can tell, from seeing a law on paper, how it will work in practice; and it is the actual working, and effect or non-effect of your experiment, that I want."

To comply with your request is simply to state, first, what has been done in this state by legislative enactments for the encouragement of agriculture, and the reasons for it: secondly, what have been the practical effects of those enactments upon the prosperity of our farming population. This, I think, embraces the whole subject. To the first part I will now draw your attention.

You are aware our staple productions of the soil are wheat, corn, oats, rye, and barley, and our attention has been most directed, and the quantities grown, according to the arrangement here made, beginning with wheat. You will see at once that so much grain-growing is exhausting to the soil, and it required more skill than our farmers possessed to keep up the production with the increase of population, and not impoverish their farms. Our forest lands, when first cleared, will always, and for several succeeding years, produce fine crops. But when these crops, although varied, were continued annually for a length of time, their intrinsic worth became inadequate to supply the exigences of their owners, and there was naturally a depreciation of produce, and consequently in the value of their farms. These effects were early noticed in this state. Many patriotic gentlemen suggested different plans as remedies, but none appeared so feasible as associations formed under legislative sanctions, for the collection and diffusion of agricultural intelligence. Some of these enactments were local in their application, but others were designed to operate throughout the state. In 1793 a law was passed, designated as "an act for the promotion of agriculture, arts, and manufactures," which was remodelled in 1804 and called "an act to incorporate a society for the promotion of the useful arts." Its objects were general and indefinite. In 1809, was passed, "an act incorporating the Society of Dutchess County for the promotion of agriculture and rural economy;" and subsequently different acts for the benefit of different counties in the state. Under these several acts I am not aware that much was done for the promotion of the objects expressed in their titles. In 1819 a law was passed entitled "an act to improve the agriculture of this state." The material parts of this act of which we wish to avail ourselves are in the words following:

"*An Act to improve the Agriculture of this State.*

[Passed, April 7th, 1819.]

1. "Be it enacted by the people of the state of

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* The society has placed £500 in the hands of the directors, to be appropriated to this purpose in the manner they may conceive most likely to secure the object in view.—*Editor.*

New York represented in senate and assembly, that the sum of $10,000 per year, for the term of two years, from and after the passing of this act, shall be, and is hereby appropriated for the promotion of agriculture and family domestic manufactures, within this state; that the said sum shall be distributed among the several counties of this state, in the manner following, to wit: [Here follows the apportionment to the several counties in this state.]

2. "And be it further enacted, that whenever an agricultural society shall be formed in any one county, or in two contiguous counties, and the members thereof shall annually procure, or raise by voluntary subscription, any sum of money, the president and treasurer shall make and subscribe an affidavit of the facts of the formation of such society, and of their having raised a certain sum, specifying the amount thereof; which affidavit shall be filed with the comptroller of this state, who shall draw his warrant on the treasurer, for the payment of a sum, equal to the amount of such voluntary subscription; not, however, in any case exceeding the amount to which such county or counties would be entitled, according to the apportionment aforesaid.

3. "And be it further enacted, that the several agricultural societies which may be formed in this state, shall elect such and so many officers as they may deem proper, all of whom shall be practical farmers; none of whom, however, shall receive any emolument from his office; and it shall be the duty of such officers annually, to regulate and award premiums on such articles and productions as they may deem best calculated to promote the agricultural and manufacturing interest of this state.

4. "And be it further enacted, that each person to whom any premium shall be awarded for any agricultural product, shall, before the receipt thereof, make as accurate a description of the process used in cultivating the soil, and in raising the crop, or of feeding the animal, as may be; and shall, in all cases, describe the nature of the soil, the kind and quantity of the manure, the state thereof, and time of the year in which applied, and deliver the same to the president of said society.

5. "And be it further enacted, that the several presidents of the said societies, shall, annually, within one week after the annual meeting of the legislature, transmit all such reports or returns to the office of the secretary of state, to be by him kept safely, till demanded by the Board of Agriculture, herein after named and organized.

6. "And be it further enacted, that the several presidents of the several agricultural societies, or a delegate to be chosen by each of the said societies, shall form a board of agriculture for this state; who, on the first Monday after the annual meeting of the legislature, may convene in the capitol, in the city of Albany, any five of whom shall form a quorum; may elect a president, secretary, and such other officers as they may think proper; receive and examine all such reports and returns as aforesaid, and select for publication, such of them, and such other essays as they may judge advisable, and shall annually publish a volume at the expense of the state, to be distributed by means of the said agricultural societies, to the good people of the states, not exceeding fifteen hundred copies of such volume; which president and secretary shall continue in office during the continuance of this act.

7. "And be it further enacted, that the treasurer of this state, shall, annually pay, on the warrant of the comptroller, to the said board of agriculture, $1000, to enable them to purchase and distribute among the several agricultural societies, such useful seeds as they may deem proper, and to defray such other necessary expenses to promote the object of this act, as are not otherwise provided for; and said board shall annually account with the comptroller for the expenditure of said money.

8. "And be it further enacted, that it shall be the duty of the secretary of this state, as soon as may be, to cause this act to be published in at least one newspaper printed in each of the great districts of this state."

You will notice that this act was to remain in force for only two years; before the termination of that time, however, another act was passed, extending its operation for four years, in addition to the first term. This first act, required the organization of county agricultural societies, who were authorized to draw a certain amount of money from the treasurer of the state, provided they raised an equal sum from among the members of the society or others. The joint sum so raised, they were authorized to distribute in premiums to objects deserving of them. The farther operation of this law, was to organize an agricultural board, under the officers of the county societies for the state. This board was required annually to receive and examine all essays and reports, and to publish such as were advisable in a volume at the expense of the state, to the number of 1500 copies, which were to be distributed to the people through the country societies. An appropriation was likewise made of $1,000 annually, to enable the board of agriculture to procure suitable seeds for distribution, through different parts of the state.

These are the principal acts that have been passed for the encouragement of agriculture up to 1830, in this state; and as the act of 1819, only extended to six years, that is from 1819 to 1825, when it expired by its own limitation, it will be with reference to this particular act, that I will state its effects as far as my observation extended.

Almost all the countries in the state organized their societies under it. As I have had no peculiar opportunities to become acquainted with its effects in other counties than my own, which is Columbia, on the North River, and as it is but fair to conclude that its objects being for the benefit of them all, its operation would be but little varied in each, permit me to give you a succinct history of its operation here. Its organization was hailed as a happy omen to our farming population. They were at that time suffering under the re-action of the high prices for land and produce of the war of 1812. Wheat was worth but about 75 cents per bushel, other produce in an equal ratio, and our best farms which had been worth $50 to $60 per acre, had fallen in price to about $25. All, therefore, suffering under the despondency created by these causes, felt that something must be done to revive the drooping spirits of the farmer, and enable him to pay his debts, and make provision for his family. It was generally acknowledged, that to do this effectually, was first to improve the sys-

tem of agriculture, which it was hoped, the wisdom of the legislature would effect, and that object obtained, the establishment of manufactures next would create a greater demand for those products, and of course, enhance their prices.

It was under these circumstances that our society commenced its operations. Premiums were offered, of from $1 to $10, for the first and second best specimens of each of our staple productions, having a reference to quantity as well as quality: but in all cases, the appearance, as well as yield, was to be above the ordinary standard, and its method of cultivation stated in a communication. Premiums were likewise offered for the exhibition of the best specimens of horses, cattle, sheep, swine, farming implements, and domestic manufactures, with a distinct and greater premium for the best cultivated farm in the district. For the purpose of awarding these premiums, committees of the members of the society were appointed. The principal farmers pretty generally enrolled themselves as members for the first two or three years. It was then observed, that although the distribution of premiums had been general throughout the county, and the good effects of the society were manifest to all, because new life was diffused throughout our whole population, and a general desire to excel in the several departments of agriculture, with a view to the attainments of the premiums—yet, as there were intelligent and leading farmers who, under every previous discouraging circumstance, were first in their neighborhoods, and who would naturally be the first to improve, and more than keep pace with their hitherto sluggish neighbors, who were now to become competitors—and who, according to the course of things, would annually bear off but a small portion of the premiums from the others—and as the first were but few in number, though scattered through the county, and the latter many—it is easily seen, that from the want of success, much the larger number would be disappointed. If these effects had lasted but for a year or two, it would not have given rise to much complaint; but of this class, a successful competitor one year, was commonly successful the succeeding year, and the premiums were necessarily taken by a few men. From this cause arose jealousies, and the law, among the many, became unpopular. At the expiration of the time for which it was last enacted, it was, consequently, not renewed. As I was not a member of the society, and of course took no premiums, I trust I was at least a disinterested spectator of its effects. Such was the operation of the law among the farmers generally. I will now give a concise history of its effects upon their agriculture. At the organization of the society, I think I have before observed, that it was in a low state. The quantity produced was small, its quality inferior—our cattle and horses illy attended to—sheep-husbandry scarcely known, and worse practised—our farms gave us but a scanty support, and houses little comfort. As illustrative of one fact, I distinctly remember one of our most enterprising and intelligent farmers observing to me, that we could not raise good clean wheat. There would be always a little rye, cockle, smut or chess in it—it was unavoidable. But when farmers were brought together at our fairs, by competition, when they saw that better articles could be produced, and that to succeed themselves, more care must be used in the selection of their seed, more judgment used in its tillage to insure a heavy crop, and skill in preparing it for market—that the way to acquire this intelligence, was to mix with the best practical farmers in the country, acquire a knowledge of their superior management, and then profit by it. The same gentleman who made to me the observation alluded to, was so far benefited by this diffusion of information, that he became one of the most successful wheat growers, both in quality and quantity, in this county; and he occasionally in subsequent life alluded to his former mistaken notions of its cultivation. I have made the allusion to this particular branch of agriculture simply to show its effects in this case upon one of our productions; but when those productions extend to all those raised by the farmer, for it would have a like effect upon each, we must come to the conclusion, that the spirit of competition and rivalry created the desire to become acquainted with the best method of raising all our agricultural products—of having it said that we had the best cultivated farm, the best arranged barns and out-houses, the best agricultural implements; that we raise more and better wheat, corn, oats, rye, or barley, upon less land than others; that we had the best stud of horses, or drove the best pair; that our hogs were the fattest, and cost the least; our cattle the finest, and most profitable, and our sheep bear competition with any other, and the independence of feeling and practical comfort growing out of any or all of these advantages. If these were any of the effects derived from agricultural societies, we must admit they were highly useful. The spirit of improvement is still somewhat rife among us. What gave it first the impulse, unless it was the excitement created by competition, I know not. For more than ten years our county society, under the law of 1819, has ceased to exist; but many of its fruits have not yet been gathered. We see it in the improved and improving conditions of our farmers: all around them denotes comfort and increasing affluence—the envy and jealousy with which they looked upon professional men has disappeared, for they are engrossing a large portion of the wealth of the community. Fifteen years ago it was a rare sight to see a farmer riding in his carriage: now it is neither novel, nor is the number few that do and can afford it. We see too, many of them selling their farms, and retiring upon the fortunes created by their industry and care. It may be asked, can their successors receive the interest upon their investments, buying farms at $100, and often more, per acre? I answer, yes. The solution is as easy as it is practical. Take, for instance, an acre of land producing wheat; it will not take extraordinary farming, in ordinary seasons, to produce twenty bushels to the acre; this at present prices would be over forty dollars worth of produce from it. Deduct one-third of the nett proceeds, for all the expenses of cultivation, and it will leave $26 66⅔ profit, giving nearly the interest, at 7 per cent. of $400 to the acre. Take oats, producing an average, neither large nor uncommon with us, of 40 bushels per acre—(we sometimes have 60 or 70—) this at present prices would be $20 per acre. Deduct again, one-third for expenses, would leave $13 33⅓, or the interest of nearly $200 per acre.

Take corn, and allow 40 bushels to the acre—this will be equal to $40, and give the same result as wheat. Rye will give about the same, or rather less profit than oats, or the interest upon $200 per acre. Barley will give as much as oats—potatoes and turnips at least double that of wheat or corn. Meadow land at 2 tons of hay to the acre, and worth $12 per ton, would leave a nett profit of $16, which would pay the interest upon nearly $250. Pasturage would take in the remaining portion of the farm, except the woodland. This would leave a profit not as large as either of the others, but still enough to make the investment a good one. You will observe that in all cases, I make a deduction of one-third of the nett proceeds for the expenses of cultivation. A long experience has taught me that where a farm is worked for a part of its produce, or by men hired for that purpose, this portion will pay all necessary expenses. It is as near to a rule as any that I can adopt; and whichever way I manage, I have always found the allowance ample. Although we feel that farming is much more profitable now than formerly, and that the increased product gives more value to our real estate, yet we frankly acknowledge that we are only tyros in our profession, and confess our ignorance and inefficiency in many things. From what has been done by a little effort, we have only a foretaste of what may be done, and we are desirous for further advancement, as there can be no doubt that the products of our soil may, with more effort, in time be doubled. I will not say that our former county agricultural society has produced these results, but it has contributed to them, I have no doubt. Still it did not meet the expectations of its friends; for when the state bounty was withdrawn, it languished and died. Had it been all that was desired, it would have sustained itself, overcome the opposition of its enemies, and diffused an extensive and prevailing opinion, that it could not be dispensed with.

You will notice that under the law of this state, of 1819, a board of agriculture was formed, whose business it was "to collect essays and facts, and to publish them annually in a volume for distribution." The board attended to the performance of this duty, and issued in all, I think, three or four volumes of about 500 pages each. I had the good fortune to obtain three of them, and to say that I was gratified by their perusal would be only giving them a kind of negative praise. I have read them again and again with both renewed pleasure and instruction. Several of the articles emanating from practical men, and evidently unused to writing, still contained many clear ideas that bear strongly upon the subject on which they treat, and are extremely valuable to the farmer, because whilst they excite a spirit of emulation, they show him how he may improve in following out many of the details of a laborious profession. There are others again drawn up by more scientific and practised pens, that would do credit to the first men of the age. It was the reading of these volumes that first gave me a taste for farming; and if the state had issued and distributed 15,000, instead of 1500 copies of each volume, it would have added millions to the wealth of her people.

I trust, Sir, I have followed out the law of 1819, and its subsequent extension to its practical effects. That it was not all that was desirable, will be readily acquiesced in: but that it has been very beneficial to our farming interest, I think, will neither admit of equivocation or denial. What has been done by legislative sanction since its expiration will be the subject of another communication.

Before I close, however, I must be permitted to say that the people of this state are greatly indebted to some of our private citizens for the zeal they have shown to aid the cause of agriculture, and the ready disposition of their purses to carry their designs into effect. Among these I must notice the late Chancellor Robert R. Livingston, who was the first president of our State Agricultural Society, and who by the introduction of merino sheep alone, and his essay upon the management of them, has added immeasurably to the value of our farms, the profits of our agriculture, and the establishment of our woollen manufactures. These are benefits so great and decided, that they cannot leave but one opinion of the prescience of the man whose efforts for the good of his countrymen have been so signally successful. Long may his memory be cherished, for he richly deserves it from us. We acknowledge a friend and patron likewise in the Hon. Stephen Van Renssalaer, who, being a large landholder himself, has always shown an interest, not only in the prosperity of his tenants, but of the whole community. The establishment of a school at his sole expense, for the study, in part, of chemistry, botany, and geology, as intimately connected with agriculture—the geological survey, made by his direction, of two counties in this state, with a view to the developement of their resources—his contributions to aid the dissemination of information in all the various ways in which it may be required—and his importation of the best breed of cattle, which have for many years been kept up, always affording a supply to our farmers who are solicitous to improve this valuable kind of stock—are so many proofs of his excellence as a man, and his philanthropy as a patriot. This list might be extended; but we must not omit the name of Le Ray de Chaumont, as one of our most public spirited citizens. I will only further add, that our successive governors have uniformly shown an interest in the advancement of agriculture; and have recommended the subject to our legislators, who, with few exceptions, seem not to comprehend it, and, of course, have generally been slow to respond to executive suggestions, and who seem to think that they are chosen to do the whole business of the community, except that which is to be beneficial to the farmer, who feeds, supports, and clothes them.

I remain your friend, &c.

J. P. BEEKMAN.

Kinderhook, December 28, 1836.

Extract from the Cultivator.

PRICE AND VALUE OF MARL AND GREEN SAND IN NEW JERSEY.

This region of country is well calculated to be one of the most productive in the state; it abounds in marl, both the green sand, and calcareous or shell marl; the former is dug in many places within two feet of the surface, and the latter generally about six feet; the first is sold at the pit for 31¼

cents a load of 20 bushels, and the last at 50 cents per load. The application to the soil of both kinds is about the same in quantity, ranging from 5 to 25 loads per acre. The greatest distance to which they have hauled from this neighborhood is about 12 miles. The general use of marl here is quite recent, and no doubt as it becomes better known, the use of it will be greatly extended; and the time will come when it will be as much an article of commerce as lime. This last spring I purchased a farm here of between 50 and 60 acres, entirely worn out; the soil of part of the farm is sand, and the rest gravel, no clay any where about it. The farm has once been productive, and I judge, therefore, that it can be made productive again. Up to this time I have spread marl (both kinds) over about one quarter of the farm, and if you think this communication worthy a place in the Cultivator, I will, from time to time, give you the result of my endeavors to improve my place.

Considering marl, lime, and plaster of Paris, or gypsum, as stimulants merely, due attention will be paid to clover and grass crops, and barn yard manure; the last being composed of all the refuse of the farm, applied in a crude or unrotted state.

* * * * *

E. H. VANUXEN.

Long Branch, N. J. Nov. 17, 1836.

From the Journal of Commerce.

DUTY ON SPIRITS.

During the last week 2,600 bushels of foreign rye were sold in one lot for distillation at 142 cents a bushel. Almost all the rye which has been imported in such great quantities during the last twelve months, has gone to the distillery. Most of our domestic supplies have gone the same way, and so has also a very large proportion of the Indian corn. Thus the bread stuffs which are imported to supply the deficiency of our own crops, are snatched away and transformed into aggravations of the distress which already exists. In this view of the case it seems to us very doubtful whether the duties on all foreign spirits might not better be repealed. They have been supposed, by enhancing the price of foreign spirits, to do something to check intemperance. But the difference from this cause is so very small as hardly to be perceived upon the small quantities which are retailed. Whether drunkenness be produced at the expense of four cents, or six cents, is a consideration which weighs very little with the drunkard. Distillation is not a species of manufacturing which we wish to cherish by protecting duties. It would require but half the ship-room to bring the whiskey, which is required to bring the rye, and possibly if the duty were repealed, and the whiskey were imported ready made, the portion of room left vacant in this way, might be filled with rye which would actually be made into bread. At any rate, we should be saved the mortification of seeing the staff of life which had been brought three thousand miles to support us, snatched away and distilled into the scythe of death.

A numerous and respectable meeting of Philadelphians have passed a resolution requesting the farmers and distillers of Pennsylvania not to purchase or sell, for distillation, or use for that purpose, any merchantable grain, for the ensuing three months. It is stated in Pitkin's Statistics, that in 1810, between five and six million bushels of grain were distilled in the United States, and it is supposed the amount is equally great at present. If distillers would put out their fires, there would be no scarcity of bread-stuffs, notwithstanding the short crops.—*Ib.*

From the Rail Road Journal.

POPPY SEED OIL.

Paris, Oneida County, New York, Oct. 1836.

Mr. D. K. Minor,

Dear Sir,—Being a subscriber to your valuable and interesting Journal, I am favored with the perusal of comments, (extracted from the Journal of the Franklin Institute,) on the production and manufacture of salad, or table oil, in the United States, to be procured from the seeds of poppy; requesting information relative to what is already considered a very interesting part of French husbandry, &c. being and having been, a participator in the interest of this very important inquiry, and being a practical manufacturer of various kinds of oils, I have made such investigations, as I will venture to pen down, in answer to the request set forth in the columns of the Journal of the Franklin Institute, and submit the same to you for publication, should it meet with such approbation as will entitle it to a place in the columns of your Journal. In December 1824, Mr. Daniel Markham, of Madison county, N. Y. obtained letters patent, from the government of the United States, for the discovery and art, of manufacturing oil from the seed of poppy, to be used for culinary, and many other important purposes. But ignorance and prejudice, being predominant in the minds of those who have been addressed on this subject, sickness and indigence on the part of the enterprising projector, have ever held in check, the advancement of this important object in this country, for which reasons, it is believed, the patentee has just claims for a renewal of his patent, for seven years after the original has ran out, to effect which, I believe, he is about to take preliminary measures. Myself and others, have from repeated trials, ascertained that 100 bushels of poppy seed can be procured from one acre of good land, after allowing amply for waste, &c. Doctor L. Bishop, of Oneida county, has raised the present season, at the rate of 147 bushels per acre, with taking very little pains in cultivation. This may seem to be, (in the minds of many,) an absurd exaggeration, but it is no less strange than true, and one bushel of this seed, will yield from eight to twelve quarts of oil of the first order; possessing (when drawn cold and pure,) a transparency equal to the best spring water, and a flavor far more delicious than the olive; it is extremely limpid, and never chills with frost. The present price of this oil, in the city of New York, is 50 cents per pint, and is sought after by the portrait painters, being the finest and best oil for their business. When burnt in a lamp, it sends forth a brilliant flame, and emits but little smoke; its medicinal qualities are mild, harmless, though effective in many cases, as proved by practice—it

seems to possess none of the narcotic quality of which the poppy is so abundantly supplied, but seems to be admirably calculated for the table, and I doubt not, but the time is near at hand, when the genteel portion of our community, may oil their palates from the production of their own soil, and no longer be under a compliment to France, Flanders, or any other foreign country, for a similar enjoyment. I think the most proper time is the fall of the year, for sowing the seed, and as late as the frost will permit—there has been by myself and others, various methods resorted to, for the cultivation of the poppy; but I venture to say, the best mode is very far in the shade; but I hope that some of our agriculturists will take the trouble to appropriate a small piece of land, and a few hours time by way of experiment on this new piece of husbandry, (however trivial it may appear at first,) I doubt not they will be highly pleased and amply rewarded for their pains.

Sir, I am with much esteem,

Very sincerely, your humble servant,

E. S. S.

HILLSIDE DITCHES AS A SAFEGUARD AGAINST WASHING RAINS.

To the Editor of the Farmers' Register.

Mecklenburg, October 17th, 1836.

I notice that "A Gleaner," in a late No. of the Register, has expressed surprise and regret, that the value of hillside ditches, was estimated less highly than formerly, by some on "Ward's Fork," who had formerly used them. There can no doubt of the complete efficacy of the system remain on the mind of any man who will take the trouble to examine some of the hilly plantations in this neighborhood, where the practice of it was originated by Mr. Skipwith, and pursued by him successfully for years, and where it has been practised by his neighbors also, with success. Like the practice of horizontal beds or ridges which proved so beneficial in the hands of Arator and others, who were generally careful to do their work accurately, if it is not accurately executed, it will carry off ten times the soil it saves. Mr. John Nelson, of Oak Hill, has a field in full view of my house, which would convince the stoutest sceptic of the efficacy of hill side ditching.

For the Farmers' Register.

COMMERCIAL REPORT.

The navigation of our rivers has been closed for nearly a month past, and our intercourse with the interior has been inconsiderable; so that commercial operations are in a great measure suspended, and there is little to report on the subject. The ice is now disappearing.

The variations in the prices of produce are unimportant. Cotton may be quoted 14 to 15 cents, total receipt in Virginia, since 1st October, about 15,000 bales—of which 11,000 were exported to Europe, and the stock now on the first and second hand, is about 1500 bales. The total receipts in the United States, compared with those of the same period last year, show an excess of 100,000 bales. Prices have declined in the large southern and western markets—but are still high—ranging from 13 to 17 cents.

The small supplies of tobacco, barely adequate to the demand for our manufacturers, caused prices to advance a little; but this is considered as momentary. New lugs sell at 3 to 4½—new leaf 5½ to 6½, not including any of the higher qualities. The state of all foreign markets is very unfavorable. Contracts are stated to have been made by the French government for Virginia tobacco, on terms equal to $7½, per 100 lbs. here. The Kentucky crop is estimated to be at least 75,000 hhds.

Foreign grain continues to arrive in considerable quantity. The wheat sells at $2 to $2 15—rye $1 35 to 1 50.

Flour is quoted in various neighboring markets, $10½ to 12. Supplies from the west are kept back by the closing of the rivers and canals.

Corn has advanced to about $4 50 per barrel, or 90 cents per bushel, and cannot be expected to recede.

The legislature of Virginia has not yet decided on granting charters for new banks, and great anxiety is felt by those interested in promoting the extension of our commerce, manufactures and public improvements, which depend on the increase of banking capital.

Jan. 24. X.

From the Oct. No. of *Annales de l'Agriculture Francaise*. Translated for the Farmers' Register.

PROFESSORSHIPS OF AGRICULEURE (IN FRANCE.)

The king has issued an *ordonnance*, upon the report of the Minister of Commerce, directing the establishment of a Royal Conservatory of Arts and Trades, and a system of public and gratuitous instruction for agriculture. The instruction will be in three courses: 1st, on Cultivation—2nd, Agricultural Construction, and Mechanics—and 3rd, Agricultural Chemistry.

Translated from the same.

ROOFS COVERED WITH PAPER.

To cover the roofs of farm buildings, especially of barns, use may be made of sheets of paper, of which the best is the paper made of wool, which is both strong and cheap. Each sheet is steeped in a boiling mixture of three-fourths of pitch and one fourth of mineral bitumen, melted together. The sheets are left to dry a day or two, when they undergo a new immersion and a second drying, and they may be immediately used. They are fastened on the roof like slates, upon laths—then covered a line and a half in thickness, by means of a brush, with a liquid composition of two-thirds tar, (*goudron*,) and one-third pitch. The whole surface is sprinkled over with sand, or with iron dust from the forge. This kind of covering is very economical, and requires but very light frame work for the roof.

HORTUS SICCUS.

In studying botany, it is of advantage to prepare a book of dried specimens of plants; such a book is termed *hortus siccus*, a dry garden.

Choose from a plant a specimen having a flower, bud, leaf, and if possible a seed. Lay it upon thick blotting paper, placing one or two sheets of the same over it; upon which, unless the specimen be very succulent and thick, lay another specimen, and then more paper. Care must be taken to lay each part of the specimen smooth and flat upon the paper; no part of the specimen should be under another part; cut off any portion that is inconvenient to retain; if any bud or flower be too thick, pare off some of the under side to make them lie properly. When they are arranged, put a heavy weight upon them—after a *few hours* carefully shift the position of each specimen to a dry part of the paper, and replace the weight; repeat this, changing the paper if necessary until the specimen is perfectly dry. Prepare a solution of gum with a little camphor in it, and secure each specimen to a page in a folio of cartridge or white-brown paper; then write under each the name of the plant, class, order, tree, shrub, herb, country, &c. In the case of any specimen being very full of sap, a hot iron may be passed two or three times over the covering of the paper—taking care not to burn it.—*Hor. Cabinet.*

ANIMAL OR PUTRESCENT MATTER IN SHELLS.

In the last No. (p. 573) was inserted an inquiry from a very intelligent correspondent, from New Jersey, which seemed indirectly to charge us with the expression of opinions inconsistent with each other. The communication having been necessarily placed in the last half sheet of the No., there was no space for the explanatory reply which will now be offered. The reader will please turn to the passage referred to, at page 573.

The authority for recent oyster shells containing but "a *very small* proportion" of gelatinous or animal matter, that could serve as alimentary manure, is in Professor W. B. Rogers' analysis of oyster shells, communicated for the Farmers' Register, and printed page 589, vol. I. Before being thus informed, we had thought the proportion of animal matter in oyster shells much more considerable—but never supposed it equal to the proportion in muscle shells. Shells formed of *laminæ*, or very thin layers, such as those of the river muscle, contain much larger proportions of animal matter. Still, this matter in an oyster shell may be exhibited to the eye, by dissolving a thin fragment in weak muriatic acid, as in the experiment referred to by our correspondent in regard to muscle shells.

But our condemnation of the opinion expressed by Sir John Sinclair of the equal value of pounded oyster shells and pounded bones, was not founded alone on the much greater quantity of animal or alimentary matter in the latter—but also on the solid matter of bones being the *phosphate* of lime, which is generally a far more valuable manure than the *carbonate*, which forms shells. The admission of equal virtue and similar effects, to substances so totally different, was as absurd in a scientific sense, as it is false practically. But though shells are very different from bones, still they are highly valuable as manure: and if they can be pounded at a moderate expense, we doubt not of that process being preferable to burning. We certainly did not mean to speak lightly of the value of shells, or to discourage their use, when denying to them the claim of similar and equal effects with those of pounded bones.

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